National Energy Board
Office national de l'énergie

Reasons for Decision

EnCana Corporation

GH-2-2006

September 2007

Facilities

Canadä

2008-02034/

National Energy Board

Reasons for Decision

In the Matter of

EnCana Corporation

Application dated 9 November 2006 by EnCana Corporation (EnCana) pursuant to Part III, section 52, of the *National Energy Board Act* for a certificate of public convenience and necessity authorizing the construction and operation of a pipeline from an offshore processing unit located 250 kilometers southeast of Halifax, Nova Scotia to a point near Goldboro, Nova Scotia.

GH-2-2006

September 2007

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Chapter 1

Disposition of the National Energy Board

The National Energy Board has received the report and recommendations prepared pursuant to section 15 of the *National Energy Board Act* regarding the Deep Panuke Offshore Gas Development Application from EnCana Corporation (EnCana). The Board has also considered the Comprehensive Study Report and the decision statement issued by the Minister of Environment under the *Canadian Environmental Assessment Act*.

The Board accepts the recommendations contained within the NEB section 15 report and adopts that report as its decision. The report and recommendations are attached herein.

The Board is satisfied that the proposed Deep Panuke Pipeline project is, and will be, required by the present and public convenience and necessity, provided that the terms and conditions outlined in Appendix II of the attached report are met. Therefore, subject to approval of the Governor in Council, a Certificate of Public Convenience and Necessity incorporating the terms and conditions in Appendix II of the report will be issued pursuant to Part III of the NEB Act.

In addition, the Board finds it appropriate for EnCana to be designated as a Group 2 Company, and orders that it be so designated.

G Habib
G. Habib
Presiding Member

R. George
Member

S. Leggett
S. Leggett
Member

Calgary, Alberta
September 2007

NEB Section 15 Report

Report and Recommendations Pursuant to Section 15 of the *National Energy Board Act*

In the Matter of

EnCana Corporation

Deep Panuke Offshore Gas Development Project

Section 52 Application dated November 2006

GH-2-2006

July 2007

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Abbreviations

Accord Acts	*Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act* and *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act*
API	American Petroleum Institute
Assembly	Assembly of Nova Scotia Mi'kmaq Chiefs
Bcf	Billion cubic feet
Board	National Energy Board
CA	Certifying Authority
CEA Act	*Canadian Environmental Assessment Act*
CNSOPB	Canada-Nova Scotia Offshore Petroleum Board
CO_2	Carbon Dioxide
CoF	Certificate of Fitness
CSA	Canadian Standards Association
CSR	Comprehensive Study Report
DFO	Fisheries and Oceans Canada
DND	Department of National Defence
DNV	Det Norske Veritas
EA	Environmental Assessment
EnCana	EnCana Corporation
ExxonMobil	ExxonMobil Canada Ltd.
FAC	Fisheries Advisory Committee
Greyhawk	Greyhawk Ridge Minerals Inc.
GCRDA	Guysborough County Regional Development Authority

GIC	Governor in Council
H_2S	Hydrogen Sulphide
JER	Joint Environmental Report
Keltic	Keltic Petrochemicals Inc.
km	Kilometer
KP	Kilometer post
kPa	Kilopascals
LMD	Legacy Military Deposits
LNG	Liquefied Natural Gas
m	Meter
M&NP	Maritimes & Northeast Pipeline Management Ltd.
m^3/d	Cubic Meters Per Day
Maple	Maple LNG Ltd.
MAARS	Maritime Aboriginal Aquatic Resources Secretariat
Minister	Federal Minister of the Environment
mm	Millimeter
MMbtu/d	Million British thermal units per day
MMscf/d	Million standard cubic feet per day
MOPU	Mobile Offshore Production (or Processing) Unit
MOU	Memorandum of Understanding
MPa	MegaPascals
NCNS	Native Council of Nova Scotia
NEB	National Energy Board

NEB Act	*National Energy Board Act*
NEB Member	National Energy Board Member
NPS	Nominal pipe size
NRCan	Natural Resources Canada
NS	Nova Scotia
NSOCFR	*Nova Scotia Offshore Certificate of Fitness Regulations*
OPR-99	*Onshore Pipeline Regulations – 1999*
OS	Offshore Standards
OSEA	Offshore Strategic Energy Agreement
OTANS	Offshore/Onshore Technologies Association of Nova Scotia
pH	Measurement unit for acidity level
ppm	Parts Per Million
QRA	Quantitative Risk Assessment
RA	Responsible Authority
SOEI	Sable Offshore Energy Inc.
SOEP	Sable Offshore Energy Project
SPANS	Seafood Producers Association of Nova Scotia
U.S.	United States
UXO	Unexploded ordnance

Recital and Appearances

IN THE MATTER OF the *National Energy Board Act* (NEB Act) and the Regulations made thereunder: and

IN THE MATTER OF an application filed with the National Energy Board by EnCana Corporation (EnCana) under file OF-Fac-Gas-E112-2006-02, for a Certificate of Public Convenience and Necessity under Part III of the NEB Act and for an Order pursuant to Part IV of the Act; and

IN THE MATTER OF National Energy Board Hearing Order GH-2-2006;

Heard in Halifax, Nova Scotia on 5, 6, 7, 8 and 9 March 2007;

BEFORE:

K.M. Bateman	NEB Member

Appearances	**Participants**	**Witnesses**
R. G. Grant, Q.C. S.H.T. Denstedt	EnCana Corporation	G. Hurley S. Fudge M. Weatherston K. Tonn D. Kopperson J.R. MacQueen T. Skrypnek
P. Benson	Canadian Association of Petroleum Producers	
D.A. Holgate	ExxonMobil Canada Ltd. Imperial Oil Resources Shell Canada Limited	
G. MacDonald	Guysborough County Regional Development Authority	
S. Foreman	Maple LNG Ltd.	
I. Leadley	Maritime & Northeast Pipeline Management Ltd.	
M. Kehoe	Myles and Associates	
R. Hunka A. Facey	Native Council of Nova Scotia	
D. Fougere	Nova Scotia Chamber of Commerce	

S.T. McGrath J. Gogan	Nova Scotia Department of Energy	G. Foote B. MacDonald
P. McEachern	Offshore/Onshore Technologies Association of Nova Scotia	P. McEachern M. O'Mahoney
J. Lugar R. Stirling	Seafood Producers Association of Nova Scotia	J. Lugar R. Stirling
B. Marcocchio M. Dittrick A. Ruffman	Sierra Club of Canada	
T. Gilfoy	Strait of Canso Superport	
D. Hansen	Environment Canada	
R. Sweeney M. McLean	Fisheries and Oceans Canada	
R. Melanson	Deep Panuke Coordinated Public Review Secretariat	
A. Hudson	National Energy Board	
Oral Statements		
Ms. Hussey	Canadian Parks and Wilderness Society	
W. Lockerby	Greyhawk Ridge Minerals Inc.	

Chapter 1

Introduction

1.1 Application

On 9 November 2006, EnCana Corporation (EnCana) filed concurrent applications with the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) and the National Energy Board (NEB) for the construction and operation of offshore gas production and export facilities (the Deep Panuke Offshore Gas Development Project or the Project) to be located approximately 250 kilometers (km) southeast of Halifax, Nova Scotia (NS). The Project's main components are a mobile offshore processing unit (MOPU), production wells, an acid gas injection well, flowlines, umbilicals and an export pipeline system.

EnCana is considering two options for the export pipeline system:

1. A 176 km, 560 millimeter (22-inch) diameter gas pipeline (the Deep Panuke Pipeline) from the MOPU to the existing Maritimes & Northeast Pipeline Management Ltd. (M&NP) pipeline near Goldboro, Nova Scotia; or
2. Two 15 km, parallel pipelines extending from the MOPU to the existing Sable Offshore Energy Inc. (SOEI) subsea pipeline (the SOEI Option).

The application before the NEB is for the Deep Panuke Pipeline only. (This is denoted on Figure 1.1, and referred to by EnCana, as the M&NP option.) EnCana applied to the Board pursuant to Part III of the *National Energy Board Act* (NEB Act) for a Certificate of Public Convenience and Necessity to construct and operate the Deep Panuke Pipeline portion of the Project and for an Order pursuant to Part IV of the NEB Act designating EnCana as a Group 2 company[1].

The remaining portions of the Project, including the SOEI Option export system, are outside the jurisdiction of the NEB. For the SOEI Option to proceed, an authorization for a connection tie-in to the existing SOEI subsea pipeline would be required under section 58 of the NEB Act.

1.2 Background

EnCana (then Pan-Canadian Energy Corporation) first submitted applications to the CNSOPB and NEB for the construction and operation of the Deep Panuke offshore gas production and export facilities in March 2002 (the 2002 Project). The 2002 Project triggered a comprehensive study under the *Canadian Environmental Assessment Act* (CEA Act), and a comprehensive study report (CSR) was completed. That CSR was subsequently approved in late 2002 by the federal

---

[1] For financial purposes, the Board has divided the pipeline companies under its jurisdiction into two groups: Group 1 companies with more extensive systems; and Group 2 companies that operate smaller systems. Group 2 companies are to be regulated using the complaint approach. Under the complaints approach, the pipeline company is responsible for providing shippers and other interested parties with sufficient information to enable them to ascertain whether the tolls are reasonable. Tariffs, once filed with the Board, automatically become effective and are presumed to be just and reasonable unless a complaint is filed and the Board is convinced that it needs to examine the tolls.

Minister of the Environment (Minister). In late 2003, EnCana withdrew its regulatory applications with the NEB and CNSOPB to allow further review and refinement of the Project.

In February 2005 the NEB, the CNSOPB, and other provincial and federal government departments, including responsible authorities (RAs) under the CEA Act, reached a Memorandum of Understanding (MOU) on Effective, Coordinated and Concurrent Environmental Assessment and Regulatory Processes for Offshore Petroleum Development Projects in the Nova Scotia Offshore Area. This set out that the CNSOPB and NEB's regulatory review processes could, where warranted, be coordinated with the environmental assessment (EA) process under the CEA Act.

In August 2006, EnCana submitted a revised Project Description to the CNSOPB. The Project triggered an EA under the CEA Act. This ultimately led to the Minister approving that the environmental assessment continue as a comprehensive study. A 2007 CSR will be completed by the RAs .

Immediately following the Minister's direction in November 2006, EnCana filed new applications to the NEB and CNSOPB for the construction and operation of the Project, which is a modification of the 2002 Project. A more detailed description of the Deep Panuke Pipeline, which is before the NEB, can be found in section 3.1 of this report.

1.3 Regulatory & Environmental Review Process

Following EnCana's November 2006 applications, and specific to those applications, the CNSOPB and the NEB signed a further MOU[2] setting out the framework for a single coordinated public regulatory review process. To facilitate the public review process, the NEB, pursuant to section 15 of the NEB Act, authorized one of its members (NEB Member) to take evidence and acquire the necessary information for the purpose of preparing this report and recommendations to the NEB, regarding the Deep Panuke Pipeline. As well, the CNSOPB appointed a Commissioner to conduct a public review of the applications that EnCana submitted to the CNSOPB.

On 14 November 2006, the Commissioner and NEB Member issued Joint Directions on Procedure which set down EnCana's applications for a public hearing. On 18 December 2006, after considering comments from parties, the Commissioner and NEB Member finalized the List of Issues for the hearing. The issues relevant to the NEB are listed in Appendix I.

The public review process included written and oral submissions. The written portion consisted of the application, the exchange of information requests and responses as well as submissions of written evidence from parties. Following the written portion, an oral hearing was held in Halifax, Nova Scotia from 5 March 2007 to 9 March 2007.

The Commissioner and NEB Member concurrently heard evidence and submissions; however, they did not constitute a "joint panel" as provided in the CEA Act. Each maintained separate and independent regulatory roles throughout the hearing process.

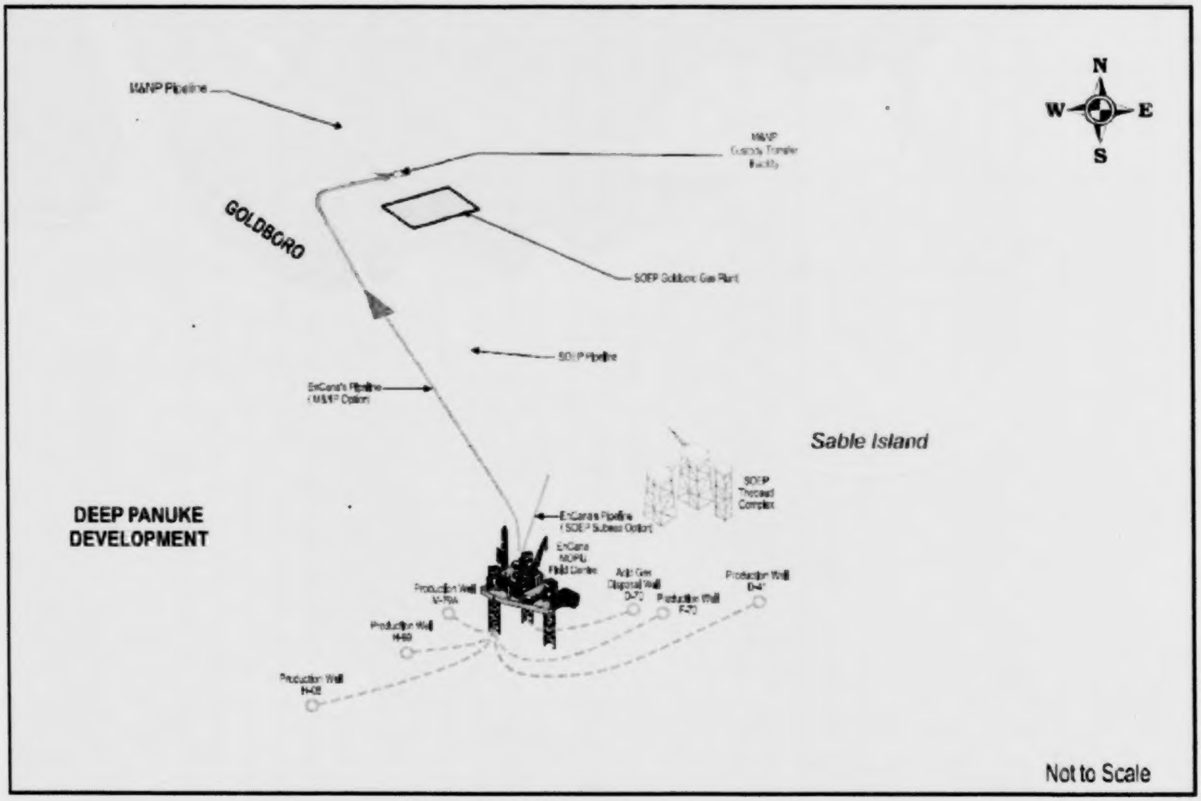
---

[2] 10 November 2006 Memorandum of Understanding between the CNSOPB and the NEB Concerning the Public Process for the Deep Panuke Project.

Following the completion of the hearing, and pursuant to the MOU between the CNSOPB and the NEB, the Commissioner and NEB Member completed a Joint Environmental Report (JER) which was submitted to the NEB and the CNSOPB on 11 April 2007 and is attached in Appendix III of this report. The JER contains the NEB Member's review of environmental matters arising from the Deep Panuke Pipeline and also provides a summary of public comments and concerns expressed in the hearing process. The RAs will consider the JER in their preparation of the 2007 CSR.

This Report, including the JER, constitutes the NEB Member's report and recommendations to the NEB pursuant to section 15 of the *National Energy Board Act*. The NEB may use this report (including the JER) and the 2007 CSR, in making its regulatory decision on the Deep Panuke Pipeline application.

Figure 1.1 Deep Panuke Map[3]


M&NP Pipeline
M&NP Custody Transfer Facility
GOLDBORO
SOEP Goldboro Gas Plant
SOEP Pipeline
EnCana's Pipeline (M&NP Option)
Sable Island
SOEP Thebaud Complex
EnCana's Pipeline (SOEP Subsea Option)
EnCana MOPU Field Centre
DEEP PANUKE DEVELOPMENT
Production Well M-79A
Acid Gas Disposal Well D-70
Production Well F-70
Production Well D-41
Production Well H-99
Production Well H-08
N
W
E
S
Not to Scale

---

[3] Proposed Field Layout, from EnCana's Deep Panuke Offshore Gas Development NEB Application, p. 1-3.

Chapter 2

Economics

2.1 Gas Supply

Deep Panuke natural gas production will be from a porous and permeable carbonate reservoir located approximately 3500 meters below the seafloor and will include the completion of four previously drilled wells and the drilling of two new wells (one production well and one acid gas injection well). In addition, three additional production wells could be drilled. As shown in Figure 2.1, the Mean production life of this Project is forecast to be 13 years.

Due to the complex nature of the reservoir and the limited number of drilled wells, EnCana used a probabilistic approach to quantify the volume of gas present in the reservoir, the volume of recoverable gas and forecasted production profiles.

Gas in Place Estimates

EnCana used basic data from wells along with seismic data to produce a detailed description of the reservoir. A three dimensional computer model of the reservoir was produced by combining the analysis with the interpretations of: reservoir geology, petrophysics, geophysics, fluid and pressure studies. This led to calculated, probabilistic estimates (P_{90}, P_{50}, P_{10} and Mean)[4] of Original Gas in Place. Finally, EnCana used dynamic reservoir simulation to ensure its modeling results were consistent with well test behaviour and to predict certain key reservoir performance parameters (example: estimates of gas recovery factor leading to Recoverable Gas in Place estimates) (see Table 2.1).

Table 2.1: Estimates of Gross Recoverable Gas in Place

	P_{90}	P_{50}	P_{10}	Mean
10^9m^3	11.0	17.4	25.1	17.8
Bcf	390	618	892	632

Forecasted Production

EnCana used a subsurface risk model to produce field gas production profiles for the P_{90}, P_{50}, P_{10} and Mean cases. Figure 2.1 is a graph showing EnCana's forecasted production profiles given its current knowledge of the reservoir and the current economic environment. The estimated production profiles assume:

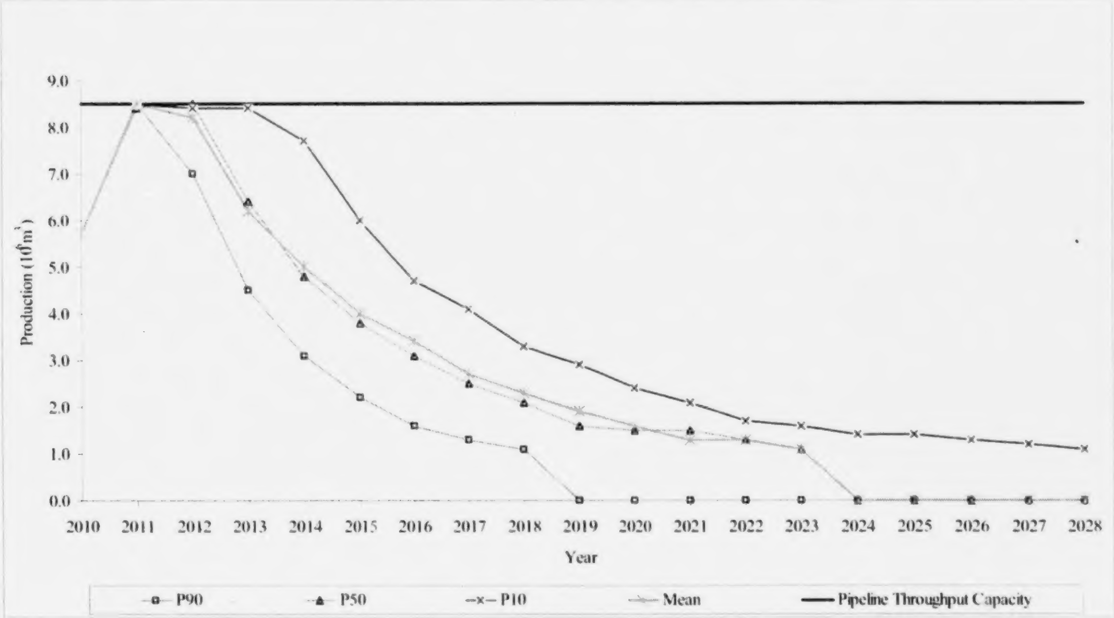
- facilities start up in late 2010 with a two month ramp-up period;
- pipeline capability is 8.5 x $10^6m^3/d$ (300 MMscf/d);

---

[4] P_{90} means value at the 90th Percentile.

- well production efficiency is 95%; and,
- estimated raw gas shrinkage factor is 0.9585.

Figure 2.1 Sales Gas Forecasts



Views of the NEB Member

The NEB Member accepts EnCana's evidence that there is a reasonable expectation that there will be an adequate supply of gas to support the use of the pipeline at a reasonable level over its economic life.

2.2 Markets

EnCana stated that the Deep Panuke Project will provide a valuable new supply source for the significant and growing natural gas markets in Maritimes Canada and the Northeast United States. Further, Deep Panuke volumes will be available to offset declines in production from the Sable Offshore Energy Project (SOEP) and will make use of existing infrastructure on the M&NP pipeline. EnCana expects that SOEP production will decrease further from its current level[5] before Deep Panuke production would commence in 2010 and this regional addition to supply would accommodate anticipated demand growth and would facilitate further development of Maritimes Canada natural gas markets.

---

[5] Raw gas production from SOEP averaged approximately 10.6 x 10^6 m^3/day, or 375 MMscf/d in October and November 2006. Although, incremental compression completed in 2006 is expected to increase production in 2007 to an average of 13.4 x 10^6 m^3/day, or 470 MMscf/d, production declines are expected to occur shortly thereafter.

EnCana indicated it will consider the sale of Deep Panuke gas at sales points in Goldboro and along the M&NP system to customers in Maritimes Canada and the U.S. Northeast. The terms and conditions of any sale would be determined by negotiation between EnCana and the buyer and will consider factors including: contract quantity; term; load factor; market flexibility; credit capacity; downstream transportation costs and availability; as well as the price in alternate markets.

Some intervenors, such as the Municipality of the District of Guysborough, The Guysborough County Regional Development Authority, and the Strait of Canso Superport Corporation Limited sought to ensure that natural gas will be available to potential buyers in the Goldboro area and that the price would not include transportation tolls on the M&NP pipeline. EnCana responded that, if sales at Goldboro are made before it commits to transport Deep Panuke volumes on the M&NP pipeline, the price would be adjusted for transportation costs to alternate markets. However, sales made after EnCana has made commitments for transportation on the M&NP pipeline would include the cost of firm transportation commitments.

> ***Views of the NEB Member***
>
> The NEB Member notes that intervenors did not dispute EnCana's evidence in regard to the size of markets available to Deep Panuke; nor, in regard to the decline in SOEP production.
>
> The NEB Member is persuaded on the basis of the evidence, that given expected decline in SOEP production and current market demand in Maritimes Canada and the U.S. Northeast, that there will be adequate market to accept Deep Panuke production.
>
> With respect to potential gas buyers having appropriate access to natural gas from Deep Panuke, the NEB Member is satisfied that this Project will allow natural gas supplies to access markets, and further, that market forces would adequately govern distribution and price discovery. In this regard the NEB Member notes EnCana's evidence that it will negotiate with any potential natural gas customer in Canada (including at Goldboro) or the United States, giving consideration to those factors outlined in EnCana's evidence. Furthermore, potential buyers may elect to negotiate for gas purchases prior to EnCana making firm transportation commitments to avoid additional costs associated with pipeline tolls.

2.3 Downstream Transportation

The M&NP pipeline provides a necessary connection to transport the volumes from the Deep Panuke pipeline to existing natural gas markets in Maritimes Canada and the Northeast United States.

EnCana's evidence indicated that although the M&NP pipeline was constructed on the basis of 530,000 MMBtu/d contracted capacity, production levels from SOEP are expected to remain below that level. EnCana cited downward revisions to estimated gas reserves by Shell Canada Limited, and the large amount of turnback capacity (270,000 MMBtu/d) proposed by current shippers seeking to reduce their contract commitment for capacity on M&NP as indication of the expected continued decline in SOEP production and the likelihood that sufficient capacity to transport Deep Panuke production will become available on the M&NP pipeline. EnCana's evidence also suggests that as much as 143,200 MMBtu/d of additional capacity on M&NP would become available by 2010 when existing transportation contracts expire. EnCana stated that, as a result, Deep Panuke volumes will increase the flow of gas on the existing M&NP Canadian pipeline and place downward pressure on tolls for all shippers.

EnCana acknowledged the possibility that should the proposed Canaport liquefied natural gas (LNG) facility and pipeline in New Brunswick be approved and 100% utilized, that downstream transportation capacity on the M&NP US system may not be sufficient. However, EnCana believes that the more likely scenario of expected decline in SOEP production and unused capacity available from existing shippers will be sufficient to transport Deep Panuke volumes using existing M&NP facilities. Should that not be the case, M&NP could design and construct additional facilities pursuant to National Energy Board Order XG-M124-60-2002.

Views of the NEB Member

> The NEB Member is satisfied that sufficient evidence has been presented by EnCana to support the reasonable expectation that volumes from the Deep Panuke Pipeline can be transported to markets via existing M&NP facilities. The NEB Member also notes that no intervenor provided evidence or views contrary to EnCana on this matter.
>
> The NEB Member notes that with the likelihood of increased gas consumption in Maritimes Canada and the expected decline in production from Deep Panuke and SOEP, new onshore facilities are not likely required. Additional M&NP facilities could however be designed and constructed if necessary.
>
> The NEB Member also acknowledges that the proposed volumes from the Deep Panuke Pipeline enable greater utilization of existing M&NP Canadian facilities, and may provide tolling benefits to all M&NP shippers, and could facilitate market growth in Maritimes Canada.

2.4 Economic Feasibility

EnCana submitted that the Deep Panuke Pipeline would be internally financed by EnCana. EnCana further stated that since no third party shippers would use the Deep Panuke Pipeline, no transportation agreement, tolls or tariff would be necessary. The pipeline would therefore be a commercially at-risk pipeline, that is, financial risks resulting from under utilization and other commercial risks would be borne solely by EnCana.

Views of the NEB Member

Based on the findings of the previous sections of Chapter 2 related to supply, markets, and downstream transportation, the NEB Member is of the view that the Deep Panuke Pipeline is likely to be used at a reasonable level over its economic life. The NEB Member also notes the sound financial situation of EnCana and is of the view that EnCana will be able to finance the Deep Panuke Pipeline, and that the Deep Panuke Pipeline is economically feasible.

Chapter 3

Pipeline Design and Safety

3.1 Description of the Facilities

The proposed Deep Panuke Pipeline would run approximately 176 km from the mobile offshore production and processing unit to the existing M&NP onshore pipeline situated near Goldboro, NS. The pipeline consists of two distinct segments: a 173 km offshore segment and a 3 km onshore segment. Table 3.1 provides a description of key specifications for the two segments.

Table 3.1: Deep Panuke Pipeline Specifications

	Onshore Segment	Offshore Segment
Pipe Diameter (mm)	560 (NPS 22)	560 (NPS 22)
Length (km)	3	173
Grade (MPa)	448 (API 5L X65)	448 (API 5L X65)
Minimum Wall Thickness (mm)	14.3	14.3
Maximum Operating Pressure (kPa)	15,300	15,300
External Coating	Fusion Bonded Epoxy	Fusion Bonded Epoxy beneath 45-80 mm concrete coating
Cathodic Protection[6]	Impressed Current	Sacrificial aluminum-zinc-iridium bracelet anode
Associated Facilities	Emergency Shut-down Valves Pig Receiver Interconnection piping to M&NP metering facility	Subsea Isolation Valve assembly Riser assembly to MOPU

EnCana submitted that the offshore pipeline will be coated with 35 MPa concrete to provide buoyancy control and on-bottom stability. The anticipated thickness of the concrete coating will vary between 45 mm and 80 mm depending on the depth of water and whether it is buried beneath the sea floor. The minimum coating thickness will also be sufficient to protect the pipeline from operational and construction loads, such as dropped objects, anchors and fishing gear impact.

---

[6] The onshore and offshore cathodic protection systems will be designed to prevent interference with adjacent SOEI and M&NP systems.

The offshore pipeline would be installed using the S lay method using either a dynamic positioned vessel or a conventional anchored barge. The type of pipelay vessel has yet to be determined. EnCana submitted that there are a limited number of pipelay vessels capable of installing the submarine pipeline and that the final selection would be based on technical capability, availability and cost.

Natural gas conveyed by the Deep Panuke Pipeline would be processed on the MOPU to meet the sales gas specifications of the M&NP pipeline. While raw gas from the Deep Panuke reservoir contains approximately 1,800 ppm H_2S and 3.5 mole % CO_2, gas will be processed offshore using an amine sweetening unit to reduce H_2S and CO_2 content to 2 ppm and 2.8 mole % respectively. Acid gas will be directed to an offshore injection well. Following sweetening, export gas will be dehydrated using a triethylene glycol, liquid desiccant process. The resultant water content of the export gas will be significantly less than levels required to form hydrates or to freeze valves on the bottom of the ocean. The MOPU, gas processing and control facilities, and the injection well do not form part of the application before the NEB.

3.2 Appropriateness of the Design

3.2.1 Project Design and Construction: Codes, Standards and Verification

EnCana submitted that the Deep Panuke Pipeline will be designed, constructed and operated in accordance with:

- applicable EnCana internal standards,
- the *Onshore Pipeline Regulations, 1999* (OPR-99),
- the *National Energy Board Pipeline Crossing Regulations, Part I*
- the *National Energy Board Pipeline Crossing Regulations, Part II,*
- the *Power Line Crossing Regulations*,
- the *Nova Scotia Offshore Petroleum Installation Regulations*, and
- the *Nova Scotia Offshore Certificate of Fitness Regulations* (NSOCFR).

EnCana also submitted that it would fulfill the requirements of the Accord Acts and the NSOCFR, by obtaining a Certificate of Fitness (CoF) from an independent Certifying Authority[7] (CA).

EnCana stated that the CA will consider all aspects of the design, construction, transportation, installation and commissioning related to general integrity, safety and avoidance of the unintended release of contaminants. The CA is required to provide an "approval in principal" of all bids submitted by the installation contractors and confirm through a design appraisal, inspection and survey that the Project facilities and structures have been designed, constructed, transported and installed in accordance with the NSOCFR. The level of survey during manufacturing and installation is determined by the effectiveness of the quality management system developed by EnCana and by the level of surveillance performed by EnCana and its Contractors.

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[7] Organizations recognized as Certifying Authorities are defined in the *Nova Scotia Offshore Certificate of Fitness Regulations*, Section 2.

EnCana advised that the CoF issued by the CA would cover both the offshore and onshore portions of the Deep Panuke Pipeline up to the custody transfer facility with the M&NP pipeline. The CNSOPB has approved EnCana's Scope of Work for the design, fabrication, transportation, construction and installation of the Deep Panuke Project[8] including the Deep Panuke Pipeline. EnCana will be required to maintain a valid CoF over the operational life of the Deep Panuke Project in accordance with the CNOCFR; however the operational role of the CA will be defined under a separate Scope of Work.

EnCana submitted that the onshore pipeline and facilities will be designed, constructed and operated in accordance with Canadian Standards Association (CSA) Z662-03. EnCana gave the opinion that CSA Z662-03 clause 11-Offshore Steel Pipelines does not provide detailed guidance on some aspects of offshore pipeline such as pressure collapse and propagation buckling. As a result, EnCana advised that it elected to design the offshore pipeline and platform riser in accordance with Det Norske Veritas (DNV) Offshore Standards (OS) *F101 Submarine Pipeline Systems, 2005* and the applicable DNV guidelines, notes and recommended practices. EnCana stated that it obtained clarification from the CA that DNV OS-F101 is appropriate and that the DNV design of the offshore section meets the requirements of CSA Z662-03 clause 11.

EnCana advised that, as part of an integrity management program to be developed, it would use annual visual inspections and baseline and annual pipeline surveys to confirm location and burial depth. It said that it would also conduct internal inspections every five years using intelligent inline inspection tools (intelligent pigs). EnCana committed to developing management systems and programs for the entire pipeline (onshore and offshore segments) to address integrity management, environmental protection, construction and operational safety, emergency management and response and security management.

Views of the NEB Member

> The NEB Member notes the requirement under the NSOCFR for an independent expert to verify the initial and ongoing fitness of the Deep Panuke Pipeline. The NEB Member recommends a condition requiring that EnCana file a copy of the CoF as well as a summary report of the CA's activities, findings and recommendations with the Board prior to filing an application for leave to open the pipeline [Condition 20].

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[8] Approved Certifying Authority Scope of Work was submitted as Exhibit B-24 and may be found on the NEB's website at www.neb-one.gc.ca under Regulatory Documents filing# A14630

The NEB Member is of the view that the effectiveness of the proposed baseline pipeline surveys and annual inspections will be subject to periodic review by the CA and the NEB. As such, the NEB Member anticipates that the surveys and inspections will be sufficient to identify and track issues of pipeline exposure, free spanning, accumulated bending strain and coating damage.

The NEB Member is satisfied that EnCana's commitment to develop final design and construction practices adhering to the regulations, adopted codes and standards can be demonstrated through the filing of further information following completion of final design. The NEB Member recommends a condition be imposed requiring EnCana to submit to the Board detailed design information related to offshore routing, span limits, anticipated strain, burial depth, trenching and burial methods, pipelay vessel specifications and pipeline interference mitigation [Condition 3]. The NEB Member also recommends conditions requiring EnCana to provide to the Board construction and inspection procedures, schedules and as-build records [Conditions 4, 12, 19 and 22].

The NEB Member is satisfied that the proposed programs and management systems for construction and operational safety, pipeline integrity, emergency response, security and environmental protection programs to be developed for both onshore and offshore pipeline facilities, would be consistent with industry codes and standards and the NEB's expectations. While all programs will be available for NEB review and audit, the NEB Member recommends that Environmental Protection, Emergency Management and Construction Safety programs be submitted to the Board prior to operation of the pipeline [Conditions 7, 8, 13, 15, 16, and 21].

3.2.2 Pipeline Routing and Proximity to SOEI Export Pipeline

EnCana submitted that the proposed offshore Deep Panuke Pipeline route parallels the SOEI pipeline for most of the proposed route and will generally be separated from it by a minimum of 250 m to 500 m. Between kilometre post (KP) 23.7 and KP 28, the two pipelines could be situated as close as eight meters apart in order to follow an ancient riverbed system that cuts through an area of rough seabed and bedrock outcrop. A greater separation would require a less desirable route that would cross over the SOEI pipeline twice to avoid unfavorable terrain.

EnCana stated that the Deep Panuke Pipeline will be designed to be stable on the seafloor when installed and will be monitored on a regular basis as part of EnCana's routine inspection, repair and maintenance program. EnCana committed to develop the detailed measures to prevent the Deep Panuke Pipeline from damaging the SOEI pipeline in full consultation with the installation contractor and SOEI. EnCana also stated that these mitigation measures would be evaluated by risk assessment, hazard identification or hazard operability studies, safety studies, monitored lay assessment, and a construction risk study.

EnCana cited its experience with the Copan Project at Cohasset-Panuke, located in the vicinity of the proposed Deep Panuke Project, as an example of successful installation of multiple pipelines in close proximity to one another. Under this project two NPS 6 and NPS 8 pipelines were laid between two and eight meters of each other over a distance of approximately nine kilometres. During the 15 years following pipeline installation, the results of monitoring indicate that the Copan pipelines remained stable and without interference.

EnCana acknowledged, under cross-examination by counsel, that the mitigation measures would require detailed knowledge of the SOEI pipeline, its terrain and its operations. It acknowledges that in the event of rupture of the SOEI pipeline the estimated repair time could be in the order of 60-90 days. During the repair period, production from the Sable Project would be shut in and SOEI could face monthly demand charge obligations approximating $12,000,000.

ExxonMobil submitted in argument that a condition is warranted requiring that EnCana not commence construction without first reaching an agreement with SOEI on the mitigation measures that EnCana would take to protect the SOEI pipeline. ExxonMobil submitted that any impasse be resolved by the NEB.

Views of the NEB Member

The NEB Member agrees that mitigation measures to protect the SOEI pipeline are required. The NEB Member acknowledges that these measures should be fair to both EnCana and SOEI. In this regard the NEB Member notes that EnCana has committed to develop mitigation measures in consultation with SOEI. The NEB Member is of the view that the NEB's General Condition 1 requiring companies to implement all commitments made in the evidence presented to the NEB, is sufficient to ensure adequate consultation with SOEI. The NEB Member recommends a condition requiring EnCana to submit to the Board a description of the mitigation measures established in consultation with SOEI to prevent interference with the SOEI pipeline as well as a summary of unresolved issues if any [Condition 3(i)].

If there are unresolved issues regarding proximity of the Deep Panuke Pipeline to the SOEI pipeline, SOEI may, in accordance with the NEB Act, apply for resolution.

The NEB Member is of the view that EnCana failed to provide evidence that it has extensive experience laying large diameter, rigid subsea pipelines in close proximity to another pipeline. The NEB Member is of the view that if the proposed pipeline is approved, once a qualified installation contractor and pipelay vessel are selected, EnCana be required to demonstrate to the Board, through documentation of previous performance or analysis, that the selected vessel has the capability to safely lay the pipeline within the proposed spacing to the pipeline [Condition 3(f)].

3.2.3 Pipeline Burial

EnCana submitted that the offshore pipeline will be buried approximately one metre deep in water depths less than 85 m. At depths greater than 85 m, the pipeline will have sufficient on-bottom stability without burial. EnCana stated that the submarine trenching method will be determined by the installation contractor but would likely proceed using a towed plough or a self propelled digging vehicle.

In areas where on-bottom stability, protection and insulation are not a requirement, natural burial would likely occur. EnCana predicted that natural burial in areas where the sea bed is sand would occur rapidly over several tidal shifts. In deeper waters, burial would be slower as tidal and sea bottom currents would be less intense. This would not pose an obstacle as on-bottom stability is less of a concern at depths greater than 85 m. EnCana submitted that during the operation of the Copan project at Cohasset-Panuke it observed progressive burial of project pipelines. Based on this experience, EnCana anticipates that trenched segments of the proposed Deep Panuke Pipeline will remain buried.

The Seafood Producers Association of Nova Scotia (SPANS) expressed concern that a burial depth of approximately one metre is insufficient given the dynamic physical environment in the Project area. The same tidal currents that would naturally re-fill the pipeline trench could, in SPANS' view, over time uncover sections of this pipeline, exposing fishing gear to damage and the fishing industry to harm. SPANS recommended a condition that all pipelines, flowlines and umbilicals be buried to a minimum depth deeper than one metre in all areas where current technology permits trenching, be monitored no less than annually, and be maintained of this depth of cover as long as they remain in place. SPANS requested access to information about locations of exposed spans where pipeline and fisheries interference could occur.

In response to SPANS' concerns, EnCana submitted that the areas along the Deep Panuke Pipeline route where it anticipates most of the fishing to occur are coincident with areas where pipeline burial and stabilization will occur. In areas where exposed pipe rests in water depth exceeding 85 m, bottom fishing is not anticipated. EnCana stated that it is also evaluating the potential risk of interaction between the buried pipeline and less common bottom fishing gear, such as a hydraulic clam dredge to be used along portions of the Deep Panuke Pipeline route by the new Clearwater vessel, MV Atlantic Seahunter. The final burial depth selection will take into consideration the results of the clam dredge study. EnCana stated that given the design circumstances, the potential for interaction between the pipeline and the fishery is remote.

EnCana submitted that the annual pipeline survey will detect the depth of pipeline cover. Should the pipeline become exposed, EnCana would, if necessary, implement a progressive monitoring program to prevent spanning issues and other appropriate remedial measures such as rock placement or sandbagging.

Views of the NEB Member

The NEB Member accepts EnCana's evidence that pipeline burial will be adequate to avoid interference with fishing activities. The NEB Member notes that EnCana did not provide evidence that progressive burial would also occur in the inter tidal and inner shelf area or that the pipeline would not become exposed along all areas where burial is proposed.

The NEB Member recognizes that EnCana will conduct subsea pipeline inspections annually or more frequently where warranted. The NEB Member is of the view that because the pipeline inspections will monitor for loss of pipeline cover, EnCana will be able to observe shifting seabed conditions and track the development of any areas of pipeline vulnerability, exposure or free spanning. The NEB Member also recognizes EnCana's commitment to implement appropriate mitigation with regards to pipeline vulnerability and exposure. The NEB Member recommends a condition be imposed requiring regular reporting to the Board of pipeline monitoring results with respect to pipeline burial and exposed pipeline spans [Condition 25]. Interested parties would have access through the NEB's online document repository to the reports submitted to the Board for various purposes including identification of potential fisheries interference. The NEB Member is of the view that EnCana has taken an appropriate approach to minimize effects on the commercial fishing industry and does not recommend imposing a condition that pipelines be trenched deeper than one meter.

3.2.4 Pipeline Abandonment

Subject to the regulatory requirements at the time, EnCana proposes to abandon the Deep Panuke Pipeline by leaving it in place and has requested conceptual approval of this abandonment plan. SPANS and Sierra Club of Canada presented argument that pre-approval of EnCana's abandonment program should not be recommended. The position of parties with respect to pipeline abandonment is further discussed in section 5.5.2 of the Joint Environmental Report.

Views of the NEB Member

The NEB Member recognizes that abandonment in place is consistent with the current practice in other jurisdictions for offshore pipelines in the absence of overriding impacts to safety, the environment or users of the sea. The NEB Member notes paragraph 74 (1) (d) of the NEB Act which requires a company to apply to the Board for leave to abandon pipeline facilities. The NEB Member recommends that no decision on abandonment should be made prior to an application under paragraph 74(1) (d) of the NEB Act. At the time of that application, the Board would require evidence in support of the proposed abandonment method to indicate that adverse effects are not likely to occur.

3.3 Public Safety

3.3.1 Accidents and Malfunctions

EnCana submits that if situations occur resulting in deviations from export gas specification values, the gas will be routed downstream of the export compressors for flaring and corrective measures to immediately bring the gas quality within specification. The primary control measures to isolate the Deep Panuke Pipeline during upset or emergency conditions are automated isolation valves on the Deep Panuke Pipeline at the MOPU located downstream of the riser and onshore at the custody transfer station. A mainline block valve located at the Deep Panuke Pipeline landfall would enable isolation of the onshore pipeline segment from the offshore segment.

EnCana proposed a formal safety assessment approach which would involve: minimizing hazards and reducing risks to as low as reasonably practicable levels; developing safety management systems; and complying with regulations and reference codes. EnCana has undertaken a quantitative risk assessment (QRA) of the onshore pipeline segment and submitted that the individual specific risk of human fatality resulting from the pipeline, under the existing development conditions, are insignificant (below 1:1,000,000). A concept safety analysis for the offshore facilities, including the offshore segments of the export pipeline would be completed as the Project moves into the front end engineering and design stage. Target levels of safety for the Deep Panuke Project, including the export pipeline would be submitted to the CNSOPB as part of the concept safety analysis required for project approval. EnCana expects that the degree of risk will be consistent for all pipeline segments.

The 100 m corridor proposed for the onshore pipeline route passes through the Goldboro Industrial Park and is designated as a Class II location under CSA Z662-03 clause 4.3.2.2, based upon potential future development scenarios. EnCana submitted that Keltic Petrochemicals Inc. (Keltic) and Maple LNG Limited (Maple) have either acquired or have an option to acquire land rights within the Goldboro Industrial Park adjacent to the established 100 m corridor. Both companies propose to construct LNG facilities. EnCana has committed to conduct a detailed quantitative risk analysis considering potential risk synergies between the nearshore and onshore components of the Project with the proposed adjacent petrochemical and LNG facilities (synergistic QRA). Any additional mitigation required would be based on the findings of the synergistic QRA; however, the additional risk assessment cannot be completed until such time as EnCana receives specific information on the relative layout of both proposed LNG facilities.

In argument the Guysborough County Regional Development Authority (GCRDA) stated it is in agreement with the proposed condition for EnCana to complete and submit to the Board a QRA addressing potential risk synergies between the Deep Panuke Pipeline and proposed adjacent LNG facilities in the post construction phase. It recommended that the QRA be conducted prior to final pipeline routing as it may impact EnCana's decision on the use of a manual versus an automatic valve at the pipeline landfall.

Views of the NEB Member

The NEB Member recognizes that both the onshore and offshore pipeline segments will be designed, installed and operated according to the NEB and CNSOPB's regulations and industry accepted design codes and standards. The NEB Member is satisfied that EnCana has demonstrated the capability to minimize risk to public safety and downstream property in the event of upset conditions.

The NEB Member notes that under future development scenarios, potential synergies between the pipeline and proposed LNG facilities may increase the consequence of a pipeline rupture above the levels determined in the onshore QRA. The NEB Member is satisfied with EnCana's proposal to address risk to the facility and public safety under future development scenarios with additional risk assessment. The NEB Member recommends a condition requiring EnCana to submit to the Board the synergistic QRA including recommendations for facility and procedural improvements for the NEB's information [Condition 23].

3.3.2 Legacy Military Deposits

EnCana filed evidence of consultation with the Department of National Defence (DND) – Formation Safety and Environment Division and received confirmation that there are no known unexploded ordnance (UXO) issues in the proposed area of the Deep Panuke Gas Development. No specific consultation occurred with respect to chemical warfare agents or radioactive material.

EnCana submitted that during project route surveys and the operation of the Copan Project at Cohasset-Panuke, numerous side scan sonar surveys were conducted in the Project area. Further, side scan sonar employed by EnCana is capable of detecting objects such as 600 mm diameter pipeline. No anomalies which could be interpreted as legacy military deposits were identified. EnCana stated that it will be conducting further side scan sonar surveys for the pipe lay and that the sea bed conditions of the Project route will be subject to a significant further review.

EnCana submitted that disturbing UXO, biological or chemical warfare agents or radioactive materials (legacy military deposit) was not considered a major risk for the Project and therefore the effects of disturbing these materials was not included in its environmental assessment.

Prior to construction, EnCana indicated that it will be required to contact DND to reconfirm the Project area usage. At that time EnCana will specifically inquire whether there are any known UXO, chemical or biological warfare agents or radioactive materials in the Project area. In the event that legacy military deposits (LMD) are identified from surveys or subsequent discussions with DND, EnCana will develop management plans into the Project environmental protection, safety and emergency response programs. EnCana also submitted that in the unlikely event of disturbing legacy military deposits, it is required to notify the responsible government agency and defer to the expertise of those agencies.

Myles and Associates filed evidence attesting to the ocean disposal of chemical warfare agents and conventional munitions off Canada's East Coast. The evidence included a 2004 Auditor General's report outlining the responsibilities of Federal departments, including the lead agency DND, to identify and locate sites of LMD; DFO - Canadian Hydrographic Service as the agency responsible for marking dump sites on navigational charts; and Environment and Health Canada as the Federal Agencies responsible for identifying and assessing risks to human and environmental health from contaminated sites, respectively. The Auditor General's report also makes reference to a ship (unnamed) containing 10,200 drums of mustard gas off of Sable Island, Nova Scotia located in 3000 m of water[9]. Myles and Associates submitted that the current inventories of LMD sites are incomplete due to poor record keeping practices after the Second World War and that health and environmental effects of disturbing legacy military dump sites are not well understood.

Views of the NEB Member

The NEB Member is satisfied that survey techniques employed by EnCana would be capable of detecting any significant LMD. The NEB Member recognizes that pipeline joining practices would be completed on a pipelay vessel and that seabed installation and survey activities would be performed using remotely operated survey and trenching equipment. Consequently workers would not be directly exposed to potentially disturbed LMD materials. The NEB Member is satisfied that EnCana's past and proposed surveys and commitment to consult DND and other expert agencies will suitably assess the likelihood of the presence of LMD along the Deep Panuke Pipeline route. The NEB Member recommends a condition requiring that EnCana publicly file with the Board a record of pre-construction verification with DND concerning military activity and the potential presence of LMD in the Project area [Condition 14].

The NEB Member notes EnCana's commitment to defer to the responsible government agencies in the event, however unlikely, that legacy UXO, warfare agents or radioactive materials are encountered during Project activities.

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[9] Evidence submitted by Myles and Associates also included a newsreel video on ocean dumping of wastes. Because the NEB was not able to retain a copy of the newsreel video and transcribe the actions depicted into the written record and since the actions captured on the newsreel were described clearly in the other evidence of Myles and Associates, the report and recommendations of the NEB Member do not turn on the basis of the video.

Chapter 4

Consultation

The expectations for an applicant regarding consultation are set out in section 3.3 of the NEB Filing Manual. Applicants are responsible for providing the principles, goals, design details and outcomes of the consultation program, including justifying the extent of consultation carried out for each application. An applicant's consultation program is expected to continue throughout the regulatory process, as well as during the construction and operation phases of a project.

4.1 Public Consultation

EnCana submitted that the principles and goals of its consultation program for the Deep Panuke Offshore Gas Development Project are as follows:

- provide information to the public and interested stakeholders about the proposed Project in a timely fashion;
- provide opportunities for the public to have input into the Project to identify issues and concerns;
- provide early and adequate notice of these opportunities for involvement and input;
- seek advice from the scientific community to enhance environmental management; and
- develop relationships with the First Nations and Aboriginals and with stakeholders that can lead, where appropriate, to mutually beneficial relationships throughout the life of the Project, and also contribute to communications around other EnCana activities.

According to EnCana, the design of its 2006 consultation program was to ensure that stakeholders and the interested public received relevant information on the Deep Panuke Offshore Gas Development Project, and were given an opportunity to provide input into project planning. EnCana stated that its 2006 public consultation program built on the previous public consultation efforts carried out for its 2002 Project.

EnCana submitted that the communications and consultation process involved various forms of interaction including electronic communication, phone contact and interviews, face-to-face interviews and meetings with individuals and small groups, group presentations and discussions, as well as public open houses in Isaacs Harbour and Guysborough. Face-to-face interviews were held with all potentially affected landowners in the onshore pipeline corridor, which is located within the Goldboro Industrial Park.

EnCana's 2006 consultation program was conducted primarily between July and October 2006. A diverse variety of groups and individuals participated, including nearshore and offshore fishing interests, local municipalities and regional development authorities, residents and businesses in the Guysborough County area, scientists, regulatory agencies, environmental non-governmental organizations, and the interested general public. EnCana filed a description of the outcomes of the public consultation program for the Project.

EnCana stated that it would continue to proactively communicate with the public and interested stakeholders, provide supplementary information as part of this ongoing process, and pursue the development of mutually constructive relationships. Specifically, EnCana suggested that ongoing communication and consultation with the offshore fishing industry could occur through the CNSOPB Fisheries Advisory Committee (FAC).

SPANS submitted that the CNSOPB FAC could not fulfill the function of continuing liaison between EnCana and offshore fisheries interests because the oil and gas industry is not normally represented on the committee, the nature of discussions would be too detailed, and it would be inappropriate to take too much time on the agenda. SPANS expressed concerns that there would be little, if any, direct contact between EnCana and the offshore fishing industry, and therefore proposed that a new fisheries committee be created to develop a working relationship between EnCana and the offshore fishing industry.

GCRDA submitted that EnCana's communications plan with Keltic Petrochemicals Inc. and Maple LNG Ltd. for construction activity should be included as a condition of approval. GCRDA also submitted that EnCana should be required to reach an agreement with Keltic and Maple, as well as with the Municipality of the District of Guysborough on pipeline routing from landfall to the metering station.

EnCana agreed in principle to a continuing liaison with offshore fishing industries to discuss and address issues of mutual concern. However, EnCana does not feel it is necessary to establish a new committee to achieve an effective working relationship. In its submission, EnCana stated that the FAC established under the auspices of the CNSOPB is an appropriate forum for such a continuing liaison. This forum also allows for regulatory oversight which can assist in the amicable resolution of issues. EnCana argued that NEB acceptance of SPANS' recommendation for an independent FAC would place EnCana in the untenable position of having to capitulate to SPANS' position on all issues.

In response to SPANS' statement that EnCana would have little, if any, contact with the fishing industry, EnCana submitted that this is not borne out in the evidence, and referred to Volume IV, the Environmental Assessment Report, Table 5.1, which outlines the stakeholders that were contacted by EnCana as part of its public consultation process. EnCana submitted that it consulted extensively with the fishing industry.

In response to requests that project approvals be conditioned upon the agreement of a third party regarding a component of the Project, EnCana submitted that requests of this nature are inappropriate and unacceptable. EnCana stated that this type of request, including the request by the GCRDA, imposes a level of uncertainty that places the Project in jeopardy because the matter is not within EnCana's control.

4.2 Aboriginal Consultation

As set out in section 3.3.1 of the NEB Filing Manual, EnCana submitted a copy of its Aboriginal Guidelines, which include the following:

- Mission Statement: To provide high-performance benchmark Aboriginal and landowner relationships within EnCana's operating communities, creating value by facilitating sustainable operations and enhancing EnCana's reputation.

- Our Values: EnCana values, embraced by employees, will guide our day-to-day relations with the Aboriginal community. These values include Open Communication, Integrity, Mutual Respect, Trust, and making a positive difference through community capacity building.

EnCana stated that its current Aboriginal communication program (the Program) has been designed taking into account advice and recommendations received from the Province of Nova Scotia as well as guidance from the Province's draft policy on consultations with the Mi'kmaq dated 14 June 2006. EnCana's goal of communications with Aboriginal groups is to establish relationships and initiate discussions with respect to the Project, highlight the findings and conclusions of the 2002 CSR with respect to Aboriginal related matters, and reconfirm commitments made in its 2002 Project application.

As set out in section 3.3.2 of the NEB Filing Manual, EnCana submitted that the first phase of the Program was to identify the Aboriginal groups who may have an interest in the proposed Project and establish initial contact with them. For that purpose, introductory letters were sent to the following organizations in July, 2006:

- each of the Chiefs of the thirteen (13) Bands in Nova Scotia;

- the Confederacy of Mainland Mi'kmaq; and

- the Union of Nova Scotia Indians.

EnCana received a reply from the Lead Negotiator for the Planning and Priorities Committee of the Assembly (Lead Negotiator), advising that the Lead Negotiator represents the above organizations on consultations issues. EnCana confirmed with the Lead Negotiator commitments made in its 2002 CSR to include Aboriginal representatives in pipeline right-of-way inspections, and advised of a prior Technical and Ecological Knowledge survey carried out in an area where the onshore portion of the Deep Panuke Pipeline is anticipated to be located.

EnCana also consulted with the Maritime Aboriginal Aquatic Resources Secretariat (MAARS) with respect to potential fisheries interactions with the Project. MAARS is a partnership of the Aboriginal Peoples Representative Organization Councils, including the Native Council of Nova Scotia (NCNS), of the large communities of Mi'kmaq, Malicite and Passamaquoddy Aboriginal Peoples who continue to reside off-reserve throughout the Maritime Region on the East Coast.

As set out in section 3.3.3 of the NEB Filing Manual, EnCana filed a description of the outcomes of the Aboriginal consultation program for the Deep Panuke Offshore Gas Development Project. EnCana stated it has maintained its communications with the Lead Negotiator and Chief of the NCNS through written correspondence, and email and telephone communications. EnCana submitted that it has committed to advance issues arising from the Program by keeping Crown and Aboriginal representatives informed of issues related to the Project, and by facilitating ongoing consultations between those parties.

NCNS submitted that EnCana's Aboriginal consultation program is in its initial stages, as only one attempt at organized consultation has been made by EnCana. As a result, NCNS argued that EnCana failed to adequately meet the NEB Filing Requirements with respect to Aboriginal consultation and requested that:

- EnCana enter into a consultation protocol and a formal consultation process with the NCNS;
- EnCana develop a direct communication plan with Aboriginal people for communal commercial fisheries; and
- EnCana invite comments from Aboriginal people on environmental effects monitoring, mitigation plans, and the environmental protection plan.

The Assembly submitted that the Project should be subject to a condition requiring meaningful consultation and a formal agreement prior to operations. The Assembly further submitted that EnCana should continue to work with the Assembly on the development of the Aboriginal liaison officer job description, and provide funding to the Mi'kmaq to engage a member of one of the thirteen First Nations in Nova Scotia as the Aboriginal liaison officer.

The Nova Scotia Department of Energy (NSDOE) submitted that Aboriginal consultations were appropriate in the context of the Project. NSDOE noted that specific steps were taken to bring details about the Project to Aboriginal groups so that they could assess potential impacts on Aboriginal rights or title. However, Aboriginal groups chose not to file evidence with respect to claimed rights or interests. NSDOE further submitted that if any concerns for potential project-related infringement of Aboriginal interests arise, these would be appropriately addressed through mitigation measures and other commitments and steps proposed by EnCana.

Regarding NCNS' proposed condition of a consultation protocol, EnCana submitted that an Aboriginal liaison officer would be a better approach to achieve the desired outcome. The Aboriginal liaison officer would consult and liaise with Aboriginal groups on a daily basis to identify opportunities for education, training and employment.

Regarding NCNS' proposed condition requiring consultation with Aboriginal people on environmental issues, EnCana submitted that this concern would be addressed through the environmental effects monitoring program, regulatory oversight, as well as through EnCana's commitment to make the results of its monitoring program public.

Regarding the Assembly's proposed condition that the Aboriginal liaison officer be a member of one of the 13 First Nations of Nova Scotia, EnCana indicated that the position would be filled by a member of the Aboriginal community; however, EnCana submitted that the position should be filled by the most qualified individual.

Regarding the Assembly's proposed condition that meaningful consultations conclude and result in an agreement prior to operations, EnCana submitted that the need for such a condition is not supported by the evidence. EnCana noted that there is no indication of significant interference with Aboriginal rights or Aboriginal treaty rights as a result of the Project; therefore, EnCana's proposed approach would be sufficient to meet Aboriginal consultation objectives.

Views of the NEB Member Regarding Public and Aboriginal Consultation

The NEB promotes the undertaking, by regulated companies, of an appropriate level of public involvement, commensurate with the setting, and the nature and magnitude of each project. This recognizes that public involvement is a fundamental component during each phase in the lifecycle of a project (i.e., project design, construction, operation and maintenance, and abandonment) in order to address potential impacts.

The NEB Member notes a lack of detail regarding EnCana's ongoing consultation program with the offshore fishing industry. In order to encourage the development of an ongoing relationship between EnCana and the offshore fishing industry, the NEB Member recommends that EnCana file with the Board, 30 days prior to the commencement of construction, its proposed methodology for reporting and liaising with the fishing industry that demonstrates the development of a mutually constructive relationship [Condition 10]. This condition would be in addition to any requirements by the CNSOPB.

With respect to conditions raised by GCRDA requiring a communications plans, and an agreement between EnCana, Keltic and Maple, and the Municipality of the District of Guysborough on pipeline routing, the NEB Member notes that EnCana has agreed to develop a communications plan, and that EnCana has committed to locate the pipeline within a pipeline corridor that is approved by the Municipality. Therefore, the NEB Member does not recommend imposing any conditions in this regard.

NCNS and the Assembly also raised concerns around EnCana's Aboriginal consultation program. As discussed in section 8.2.6 of the Joint Environmental Report, the NEB Member recommends that EnCana be required to file with the Board an update on EnCana's Current and Traditional Use Review and an update of any outstanding issues arising from EnCana's Aboriginal consultation program [Condition 11]. The NEB Member notes EnCana's commitment to identify and address project-related impacts on Aboriginal people throughout the life of the Project. Given the absence of evidence to support the need for the conditions proposed by NCNS and the Assembly, the NEB Member is satisfied that

EnCana's commitment to work with Aboriginal groups would achieve the intent of the conditions proposed by NCNS and the Assembly. Therefore, the NEB Member does not recommend imposing any conditions in this regard.

Given the above conditions and EnCana's commitment to ongoing consultation, the NEB Member is of the view that the Aboriginal and public consultation programs undertaken by EnCana are consistent with the intent of the NEB Filing Manual.

Chapter 5

Socio-Economic Matters

The NEB defines a socio-economic effect in respect of a project as any effect on a socio-economic element found in Table A-5 of the NEB Filing Manual, including direct effects, as well as effects resulting from a change in the environment. As part of its application, EnCana filed a socio-economic impact assessment for the Project that considered the potential effects of the Project on socio-economic elements.

The JER addressed potential socio-economic effects resulting from a change in the environment. In this section of the report, the NEB Member has considered other potential socio-economic effects, including effects on employment, economy, and services.

5.1 Employment and Economy

EnCana submitted that the Deep Panuke Offshore Gas Development Project represents an important step in the further development of the offshore oil and gas industry in Atlantic Canada. Further, there would be a positive contribution to local and provincial employment, incomes and gross economic output.

EnCana committed to provide specific levels of economic activity within Nova Scotia during the Project. EnCana also committed to businesses in Nova Scotia and other parts of Canada having a full and fair opportunity to supply goods and services, with first consideration to qualified Nova Scotians.

EnCana estimated that the construction phase expenditures for the Deep Panuke Offshore Gas Development Project (*i.e.*, EnCana Project management, subsea costs, export pipeline cost, drilling and pipeline cost, and contingency) are estimated at $700 million (2006 dollars) over four years ending in 2010, including estimated capital costs of $234 million for the Deep Panuke Pipeline. EnCana committed to providing not less than 623,000 person hours on engineering, procurement, and management activities for the Deep Panuke Pipeline. In addition, receiving, handling, double jointing, coating, and shipping activities with respect to the Deep Panuke Pipeline would occur in Nova Scotia and would comprise not less than 37,000 person hours.

EnCana stated that based on discussions with the Province of Nova Scotia regarding the Project, it would provide Nova Scotians opportunities and benefits which include royalties and funds for research, development, education, training and programs for disadvantaged groups. EnCana committed to provide specific industrial and employment opportunities for Nova Scotians, with minimum commitments for person hours of work in Nova Scotia as well as person hours of work for individuals defined as Nova Scotians. These commitments, related to the Canada-Nova Scotia Benefits Plan under the Accord Acts, are documented in the Offshore Strategic Energy Agreement (OSEA) dated 22 June 2006.

5.2 Services

In the event that both the Keltic and Maple LNG projects proceed, EnCana stated that there may be overlaps in the construction schedules and the onshore pipeline work required for the Deep Panuke Pipeline, which could impact the availability of local accommodation. EnCana stated that it would provide regular communication on construction schedules and activities and if necessary develop a strategy with relevant stakeholders to secure accommodation.

> ***Views of the NEB Member regarding Socio-economic Matters***
>
> The NEB promotes the identification and consideration, by regulated companies, of the effects of projects on individuals, groups, communities and societies; including a project's positive and negative socio-economic impacts and any proposed enhancement and mitigation measures.
>
> The NEB Member notes the OSEA deals with specific industrial and employment benefits, commitments and processes that cover all phases of the Deep Panuke Offshore Gas Development Project. The NEB Member finds it reasonable to conclude that some proportion of the benefits are likely to arise from the Deep Panuke Pipeline portion of the larger Project. While recognizing that a benefits plan is a statutory obligation in this case, the execution of an agreement such as the OSEA is a positive example of an energy industry proponent ensuring that the local and regional population benefits from a project.
>
> After consideration of the relevant aspects of the OSEA, and given EnCana's commitments regarding employment, income, and economic benefits, the NEB Member is of the view that EnCana has adequately considered the positive and negative impacts on employment and economy for the Deep Panuke Pipeline.
>
> The NEB Member is also of the view that EnCana has adequately considered the impacts on services for the Deep Panuke Pipeline.

Chapter 6

Land Matters

EnCana indicated that the 3 km onshore pipeline will be situated in a 100 m pipeline corridor that will be established by the Municipality of the District of Guysborough within the Municipality's Goldboro Industrial Park. EnCana also indicated that discussions are ongoing with the Municipality and others to finalize the pipeline routing and to develop an agreement for locating the pipeline within the 100 m pipeline corridor.

None of the participants in the Deep Panuke Public Review raised any concerns related to the acquisition of land rights for the Deep Panuke Pipeline.

Views of the NEB Member

The NEB Member is of the view that there is no need to recommend conditions regarding land matters.

Chapter 7

Mineral Exploration Licence Holders

Greyhawk Ridge Minerals Inc. (Greyhawk) and Mr. Kevin McAllister expressed concern regarding possible damage from the Project to their interests as holders of exploration licences in the onshore area of the proposed Deep Panuke Pipeline.

Greyhawk submitted that it obtained its interest from Heartland Resources Inc. and that Heartland had raised similar concerns regarding the effects of the SOEI and M&NP pipelines on its exploration licences. According to Greyhawk, Heartland applied under the NEB Act to the Minister of Natural Resources for compensation but that an arbitration committee appointed by the Minister had denied Heartland's compensation claim. Greyhawk argued that this process was unsatisfactory and asked the NEB Member to recommend that the NEB condition EnCana to compensate exploration licence holders in a fair and timely manner for economic damages resulting from EnCana's construction and operation of the onshore portions of the Deep Panuke Pipeline.

Mr. McAllister requested that EnCana state its position on mitigation and compensation for exploration licence holders for damage done to them. Mr. McAllister did not provide any information on mitigation, other than compensation, that could address his concerns.

EnCana submitted that Greyhawk had no legitimate claim for compensation and that, in any case, the NEB Act provides a process for providing compensation for damage claims. According to EnCana, an application to the NEB does not trigger the compensation process. Accordingly, EnCana requested that the NEB Member recommend that the NEB deny the condition proposed by Greyhawk.

Views of the NEB Member

The NEB Act, in Part V, provides a procedure for determining the right to, and the amount of, compensation for damages from the construction and operation of a pipeline. This procedure begins with a notice to the Minister of Natural Resources and is not part of an application to the NEB.

The NEB Member is of the view that the Board does not have the authority to require EnCana to provide compensation to Greyhawk or Mr. McAllister. Accordingly, the NEB Member recommends denying the requests of Greyhawk and Mr. McAllister. Any claims for compensation should be addressed to the Honourable Gary Lunn, Minister of Natural Resources at:

580 Booth Street
Ottawa, Ontario K1A 0E4

Chapter 8

Financial Regulation

EnCana submitted that the Deep Panuke Pipeline would be a small shipper-owned pipeline and would not involve third party shippers. EnCana was of the view that it would be appropriate to be regulated as a Group 2 company in respect of the Deep Panuke Pipeline. This designation would be consistent with the designation granted to the SOEP pipeline. Furthermore, EnCana asked to be relieved from the requirement of filing audited financial statements with the Board.

Views of the NEB Member

The NEB Member accepts EnCana's submission that the Deep Panuke Pipeline would be a small shipper-owned pipeline. Therefore, the NEB Member recommends granting Group 2 status to EnCana in respect of the Deep Panuke Pipeline for financial regulation. As such, EnCana would be required to maintain separate books of account for the Deep Panuke Pipeline in accordance with generally-accepted accounting principles.

As permitted by the Memorandum of Guidance for Regulation of Group 2 Companies dated 6 December 1995, the NEB Member's recommendation is to grant EnCana's request to be relieved from the requirement to file audited financial statements. However, if third parties were to become shippers on the pipeline, the Board may revisit this relief.

Chapter 9

Recommendations

The Deep Panuke Pipeline, if approved and built, will transport gas from a new offshore field to market. The NEB Member accepts EnCana's evidence that the supply of gas is sufficient to support the pipeline and that there are markets for that gas in Maritimes Canada and the United States. In the opinion of the NEB Member transporting a new supply of natural gas to market is a significant benefit of the Deep Panuke Pipeline.

The NEB Member notes EnCana's commitment to make Deep Panuke gas available in the Goldboro region on a competitive basis. Up until the time that EnCana contracts to ship Deep Panuke gas on the M&NP pipeline, potential gas consumers in the Goldboro area may contract to purchase gas and potentially avoid the additional costs associated with tolls of the M&NP pipeline. The NEB Member finds that should this occur, the local supply of gas on favorable terms would be a distinct benefit for the community.

The NEB Member finds that the Deep Panuke Pipeline, in conjunction with the Deep Panuke field development, would act as an incentive for further exploration offshore Nova Scotia. The Project would also allow greater utilization of the M&NP pipeline and may provide cost-savings to existing shippers on that pipeline through reduced tolls.

The NEB Member is of the opinion that there will be direct economic benefits to the Maritimes and broader economic benefits to the rest of Canada as a result of the $234 million that EnCana will spend on the construction of the Deep Panuke Pipeline over the expected four years of construction.

Intervenors have raised concerns about the impact of the pipeline on the Nova Scotia offshore fishery. Table 6.32 of the 2002 CSR and Table 8.1 of the JER describe the standard mitigation that EnCana will undertake to address impacts on the fishery. The NEB Member is satisfied that these measures will adequately mitigate any impact on fish or fish habitat.

With any large scale project, safety related to the public and to those working on the pipeline is always a primary concern. As outlined in Chapter 3, Pipeline Design and Safety, the requirements of the applicable regulations, numerous commitments made by EnCana and recommended conditions reduce these concerns to a reasonable and an acceptable level. Concerns were also raised about pipeline integrity impacts of the Deep Panuke Pipeline on the neighbouring SOEI pipeline. As described in section 3.2.2 of this report, the NEB Member is of the opinion that these concerns have been sufficiently addressed.

The construction of the pipeline will impact the natural environment both onshore and offshore of Nova Scotia. It will also have some negative social effects. Any negative environmental and social impacts would be reduced below the level of significance by following the recommendations set out in the Joint Environmental Report (JER) and chapter 5 of this Report.

The NEB Member is of the view that any impacts remaining after mitigation, whether environmental, social, or on the fishery, are outweighed by the benefits of the Pipeline.

EnCana is proposing two export pipeline options; however, the application before the NEB addresses only the Deep Panuke Pipeline which would connect the MOPU to the onshore M&NP pipeline. The other option, which is not before the NEB, is a shorter subsea pipeline that would connect with the existing SOEI pipeline (SOEI Option).

The NEB Member notes that the owners of the SOEI pipeline support EnCana's application for the Deep Panuke Pipeline. Some parties have suggested that only the SOEI Option should be approved because of its smaller footprint. Acceptance of this view would mean that the NEB Member should deny EnCana's application for the Deep Panuke Pipeline even if its benefits outweigh its burdens. In its applications to the NEB and the CNSOPB, EnCana has maintained that it must retain the option to determine the most appropriate option for the export pipeline. The NEB Member cannot be certain that such a denial would result in EnCana being able to pursue the SOEI Option on terms acceptable to it. The NEB Member agrees that in this case where there is an absence of major negative impacts that would outweigh the benefits from the Deep Panuke Pipeline, market forces should be allowed to prevail and EnCana should be able to make the final decision on the appropriate option.

This and the preceding chapters along with the Joint Environmental Report constitute the NEB Member's report and recommendations and the associated reasons in respect of the EnCana's application to the NEB in the GH-2-2006 proceeding. The NEB Member is satisfied that the Deep Panuke Pipeline is in the interest of the present and future public convenience and necessity. Accordingly, the NEB Member recommends that the NEB approve, with the conditions attached in Appendix II, EnCana's application for:

a) a Certificate of Public Convenience and Necessity pursuant to Section 52 of the NEB Act authorizing EnCana to construct and operate the Deep Panuke Pipeline; and

b) an order pursuant to Part IV of the NEB Act designating EnCana as a Group 2 company in respect of the Deep Panuke Pipeline and exempting EnCana from any requirements to file financial statements with the NEB.

Kenneth Bateman

National Energy Board Member

Calgary, Alberta

July 2007

Chapter 10

Acknowledgements

The National Energy Board is committed to ensuring that all stakeholders are engaged effectively in the Board's public process. One aspect of this commitment is to have effective public participation in oral hearings. The NEB Member would like to acknowledge the participation of all parties in the Deep Panuke hearing. The time and effort that the parties spent to meaningfully participate in the public hearing was noted, and through their participation, the NEB Member collected highly relevant evidence for use in deliberations that lead to the recommendations in this report.

Appendix I

List of Issues

The Commissioner and the NEB Member identified issues for consideration in the hearing. Some issues are common to both the NEB and the CNSOPB while some are of interest to the NEB only.

Joint NEB and CNSOPB Issues

1. The economic feasibility of the proposed facilities having regard to, among other things:
    - The outlook for long term demand for natural gas in the markets to be served by the proposed facilities
    - The outlook for long-term supply of natural gas for the proposed facilities.
2. The potential environmental and socio-economic effects of the proposed facilities including those described in the Scope of the Environmental Assessment for the Comprehensive Study under the *Canadian Environmental Assessment Act.*
3. The safety and design of the proposed facilities.
4. The inspection and monitoring of construction, operation and maintenance, and the decommissioning and abandonment of the proposed facilities.
5. The appropriateness of the routing of the proposed pipeline facilities.
6. The appropriateness of public and Aboriginal consultation.

NEB Issues

7. The need for the proposed pipeline.
8. The potential impact on landowners, mineral rights holders, and communities affected by the selected route of the onshore portion of the proposed pipeline.
9. Land requirements and the land acquisition process relative to the onshore portion of the proposed pipeline.
10. The potential commercial, economic, supply and market impacts including criteria for access to pipeline and associated tolls and tariff matters.
11. EnCana's request to be regulated as a Group 2 company, as described in the National Energy Board's Memorandum of Guidance dated 6 December 1995.
12. The appropriate terms and conditions to be included in any certificate granted by the NEB.

Appendix II

Recommended Certificate Conditions

Should the Board decide to approve the application, the NEB Member recommends that the following conditions be attached to the Certificate of Public Convenience and Necessity.

General Conditions

1. EnCana shall cause the approved Project to be designed, located, constructed, installed, and operated in accordance with the specifications, standards and other information referred to in its application or as otherwise agreed to during questioning or in its related submissions.
2. EnCana shall implement or cause to be implemented all of the policies, practices, programs, mitigation measures, recommendations and procedures for the protection of the environment included in or referred to in its application or as otherwise agreed to during questioning or in its related submissions.

Prior to Construction

3. EnCana shall file with the Board, at least 60 days prior to construction or as the Board otherwise directs, the following documentation related to final offshore pipeline design and construction methods:
    a) proposed detailed pipeline routing;
    b) acceptable limits for unsupported pipeline spans;
    c) anticipated accumulated plastic strain following installation for pipeline and girth welds;
    d) anticipated lifetime accumulated plastic strain for the pipeline and girth welds
    e) design pipeline burial depth;
    f) pipelay vessel type and specifications;
    g) submarine trenching method;
    h) submarine burial method; and
    i) a description of on-bottom stability controls and installation methods for the offshore pipeline designed to prevent interference with the Sable Offshore Energy Project Export Pipeline (SOEP), as established in consultation with SOEP owners. Include in the description a summary of any issues relating to installation methods that are unresolved with the SOEP owners and the method that EnCana proposes to resolve those issues.
4. EnCana shall file with the Board, at least 60 days prior to construction of the approved facilities, a detailed construction schedule or schedules identifying major construction activities for both the Onshore and Offshore segments of the pipeline and shall notify the

Board of any modifications to the schedule or schedules as they occur and the reasons for those modifications.

5. EnCana shall file with the Board for approval, at least 45 days prior to construction, a Horizontal Directional Drilling (HDD) landfall feasibility assessment, which provides EnCana's landfall pipeline proposed installation method and rationale for the decision. This assessment shall include the following elements as a minimum:
   a) a comparative review of the different potential landfall pipeline installation methods;
   b) geotechnical and construction feasibility assessments performed by persons with subject expertise to support the preferred and applied-for landfall pipeline installation method;
   c) reports on environmental impacts studies as completed;
   d) reports on geotechnical studies as completed; and
   e) a hazard analysis and contingency measures completed for the selected installation method.

6. If watercourses or wetlands are present within the selected onshore route, EnCana shall file with the Board for approval, at least 45 days prior to construction, an assessment which provides EnCana's wetland and watercourse crossing method and rationale for the decision. The assessment to support the preferred and applied for crossing method shall include, but is not limited to, the following elements:
   a) a detailed description of the wetlands and watercourses to be crossed; and
   b) a comparative review of the different potential wetland and watercourse crossing methods, including Horizontal Directional Drilling (HDD), comprising information on:
      i. technical feasibility;
      ii. potential environmental effects, including lost of ecological functions; and
      iii. estimated relative costs.

7. EnCana shall file with the Board for approval, at least 45 days prior to the Onshore construction, an updated, project-specific Environmental Protection Plan (EPP) for the Onshore pipeline. This EPP shall provide an elaboration of all commitments and a comprehensive compilation of all environmental protection procedures, mitigation measures, as developed and as set out in EnCana's applications for the NEB regulated Onshore pipeline, and subsequent filings. The EPP shall describe the criteria for the implementation of all procedures and measures, and shall use clear and unambiguous language that confirms EnCana's intention to implement all of its commitments. Onshore construction shall not commence until EnCana has received approval of its EPP from the Board. The project-specific EPP shall address, but is not limited to, the following elements:
   a) environmental procedures, criteria for implementation of these procedures, mitigation measures applicable to all Onshore project phases, and activities;
   b) a reclamation plan which includes a description of the condition to which the applicant intends to reclaim and maintain the right-of-way once the

construction has been completed, and a description of measurable goals for reclamation; and
c) evidence of consultation with relevant regulatory authorities that confirms their satisfaction with the proposed mitigation.

8. EnCana shall file with the Board for approval, at least 45 days prior to the Offshore construction, an updated, project-specific Environmental Protection Plan (EPP) for the offshore pipeline. This EPP shall provide an elaboration of all commitments and a comprehensive compilation of all environmental protection procedures and mitigation measures, as developed and as set out in EnCana's applications for the NEB regulated offshore pipeline, and subsequent filings. The EPP shall describe the criteria for the implementation of all procedures and measures, and shall use clear and unambiguous language that confirms EnCana's intention to implement all of its commitments. Offshore construction shall not commence until EnCana has received approval of its EPP from the Board. The project-specific EPP shall address, but is not limited to, the following elements:
   a) environmental procedures including site-specific plans (such as EnCana's Code of Practices for Sable Island, The Gully Marine Protected Area and Country Island), criteria for implementation of these procedures, mitigation measures applicable to all offshore project phases, and activities; and;
   b) evidence of consultation with relevant regulatory authorities that confirms their satisfaction with the proposed mitigation.

9. EnCana shall file with the Board, at least 45 days prior to construction, the detailed onshore route selected by EnCana. The detailed onshore route shall describe the following elements:
   a) alternative routes considered and the reasoning for the onshore route selected;
   b) measures and actions taken by EnCana to avoid any sensitive features (e.g. for breeding birds or species of conservation concern), sensitive habitats and identified areas containing contaminated soils when finalizing the selection of the onshore route; and
   c) presence and nature of sensitive features, such as watercourses and wetlands, sensitive habitats, as well as identified areas containing contaminated soils within the disturbance footprint of the Onshore Project.

   EnCana shall not deviate from the selected route without prior approval from the Board.

10. EnCana shall file with the Board, 30 days prior to the commencement of construction, its proposed methodology for reporting and liaising with the fishing industry, that demonstrates the development of a mutually constructive relationship.

11. EnCana shall file with the Board, 30 days prior to the commencement of construction:
   a) an update on EnCana's Current and Traditional Use Review with the Assembly of Nova Scotia Mi'kmaq Chiefs and the Native Council of Nova Scotia, including:
      i. a summary of the results of Phase 1 (i.e., a review by Aboriginal groups of the applicability of the findings of studies and opinions pertaining to the current and traditional use in the onshore pipeline corridor and nearshore marine landfall areas for the Deep Panuke Project); and

    ii. if necessary, a summary of the results of Phase 2 (i.e., a focused Mi'kmaq Ecological Knowledge Study to address any gaps in knowledge of Aboriginal current and traditional use the Deep Panuke onshore pipeline corridor and nearshore pipeline landfall area).

  b) an update of any outstanding issues arising from the Aboriginal consultation program, and for approval, a summary indicating how EnCana will incorporate the findings and address any issues from the current and traditional use review into the Project.

12. EnCana shall file with the Board, 30 days prior to construction unless otherwise directed by the Board, a schedule of inspection and verification activities to be undertaken by EnCana and its contractors, independent third parties, and the Certifying Authority[10] during the installation of the offshore pipeline segment. The schedule of inspection and verification activities should include the type and target of the quality control activity, the name of the inspecting agency, the required qualifications of the inspecting party, duration of the activity, frequency of inspection and reference to the applicable quality standard for the activity. EnCana shall notify the Board of changes to the schedule of inspection and verification activities.

13. EnCana shall file with the Board for approval, at least 30 days prior to construction, a final and updated project-specific Environmental Effects Monitoring Plan (EEMP) and Compliance Monitoring Plan for the NEB regulated pipeline.

14. EnCana shall file with the Board, 30 days prior to Construction, a record of consultation with the Department of National Defence - Formation Safety and Environment[11] with respect to operational concerns and the presence of sites containing legacy munitions or unexploded ordnance, biological or chemical warfare agents and radioactive materials within the Project Area.

15. EnCana shall file with the Board, at least 14 days prior to construction, a Construction Safety Manual for the Onshore segment of the Deep Panuke Export Pipeline and associated facilities.

16. EnCana shall file with the Board, at least 14 days prior to construction, a Construction Safety Manual for the Offshore segment of the Deep Panuke Export Pipeline and associated facilities.

17. EnCana shall file with the Board, at least 14 days prior to construction, a detailed breeding bird survey. The survey shall include:
    a) a special attention directed at locating:
        i. SARA listed species (such as the Short-eared Owl);
        ii. species currently considered for inclusion to the SARA list (such as the Rusty Blackbirds); and
        iii. migratory birds (such as the Greater Yellowlegs).

---

[10] As per Nova Scotia Offshore Certificate of Fitness Regulations (SOR/95-187) Section 4.(1)

[11] National Defence - Formation Safety and Environment or any successor or agency performing substantially similar functions with respect to legacy munitions or unexploded ordnance, biological and chemical warfare agents and marine radioactive dumpsites.

b) evidence to confirm that relevant regulatory authorities had an opportunity to review and comment on the proposed methods for the survey;
c) the results of the survey; and
d) if applicable, evidence of consultation with relevant regulatory authorities, such as Nova Scotia Department of Natural Resources (NSDNR) and Environment Canada, regarding satisfaction with the proposed mitigation strategies.

During Construction

18. If contamination or acidic drainage is encountered during the Geotechnical Testing Program along the easement:
    a) EnCana shall file with the Board, at least 14 days prior to the commencement of the remediation:
        i. detailed description of the extent and nature of the contamination or acidic drainage encountered;
        ii. a detailed site assessment;
        iii. a remediation plan; and
        iv. evidence of consultation with relevant regulatory authorities that confirms satisfaction of the proposed remediation plan and associated mitigation.
    b) EnCana shall commence remediation within a year of encountering contamination.

19. Unless the Board otherwise directs, EnCana shall, during construction, maintain at each construction site for inspection and audit purposes a copy of the welding and non-destructive examination procedures used on the project.

Post Construction

20. EnCana shall file with the Board, at least 7 days prior to submitting an application for Leave to Open of the offshore pipeline segment, a copy of the Certificate of Fitness issued by the Certifying Authority and a summary report of the Certifying Authorities' activities, findings and recommendations.

21. EnCana shall file with the Board 3 copies of its Emergency Preparedness and Response Manual for both the Onshore and Offshore pipeline segments, at least 30 days prior to submission of leave to open application(s). In preparing its Emergency Preparedness and Response Plan, EnCana shall refer to Board letter dated 24 April 2002 entitled Security and Emergency Preparedness Programs addressed to all oil and gas companies with facilities under the jurisdiction of the National Energy Board. EnCana shall regularly review and file updates to the program, as necessary, with the Board.

22. EnCana shall file with the Board, within 6 months of completion of pipe laying and construction, an as-built pipeline survey report and maps including as- constructed trench and burial details, encountered seabed conditions and protection measures.

23. EnCana shall file with the Board, within 1 year of commencing operation, unless the Board otherwise directs, a quantitative risk assessment (QRA) addressing potential risk synergies between the Deep Panuke Export pipeline and proposed adjacent liquefied natural gas (LNG) facilities. The QRA shall include any facility upgrades, process improvements or other measures required to ensure that Project risk targets are maintained during the construction and operation of any proposed LNG facility development.

24. Within 30 days of the date that the approved Project is placed in service, EnCana shall file with the Board a confirmation, by an officer of the company, that the approved Project was completed and constructed in compliance with all applicable conditions in this Certificate. If compliance with any of these conditions cannot be confirmed, the officer of the company shall file with the Board details as to why compliance cannot be confirmed. The filing required by this condition shall include a statement confirming that the signatory to the filing is an officer of the company.

25. EnCana shall file with the Board annually, unless the Board otherwise directs, a report describing exposed segments of the Offshore pipeline. The report shall, for the entire length of the pipeline, include the following information as a minimum:
    a) a description of the monitoring methodology used;
    b) a description of all exposed pipeline segments and free spans, including the location, length, sea bottom geology, water depth and any associated issues;
    c) a description of observed coating or pipeline damage;
    d) proposed changes to the pipeline monitoring program; and
    e) as appropriate, proposed mitigative measures and follow-up actions with regards to proposed pipeline exposure and free spanning conditions.

26. Unless the Board otherwise directs prior to 31 December 2010, this Certificate shall expire on 31 December 2010, unless construction in respect of the Project has commenced by that date.

Appendix III

Joint Environmental Report

DEEP PANUKE COORDINATED PUBLIC
REVIEW SECRETARIAT

SECRÉTARIAT DE L'EXAMEN PUBLIC
COORDONNÉ DE DEEP PANUKE

JOINT ENVIRONMENTAL REPORT

Pursuant to the 10 November 2006 Memorandum of Understanding between the Canada-Nova Scotia Offshore Petroleum Board and the National Energy Board Concerning the Public Process for the Deep Panuke Project

This report is the summary and recommendations of the Commissioner and the NEB Member to the CNSOPB and the NEB, with respect to environmental matters brought before the Deep Panuke Coordinated Public Review Process

Deep Panuke Offshore Gas Development Project

Applicant Name:	EnCana Corporation (EnCana)
Application Date:	9 November 2006
National Energy Board (NEB or Board) File Number:	OF-Fac-Gas-E112-2006-02 01
CNSOPB File Number:	EDP40.002
Joint Environmental Report Publication Date:	11 April 2007
CEA Registry Number:	06-03-21748

JOINT ENVIRONMENTAL REPORT SUMMARY

EnCana Corporation (EnCana) is proposing to develop the Deep Panuke Offshore Gas Development Project (the Project), approximately 250 kilometers (km) southeast of Halifax, Nova Scotia (NS). The initial well program will consist of re-completing four existing production wells, drilling one new injection well in Margaree and one new production well in Panuke. Up to three new production wells could be drilled after first gas in Cohasset, Deep Cohasset, Panuke or Margaree. First gas is anticipated to be produced in late 2010. Expected Project life range is 8 to 17.5 years. The main Project components include a Mobile Offshore Production Unit (MOPU), subsea flowlines and umbilicals, subsea wells, and an export pipeline. A figure illustrating these proposed facilities is located on the subsequent page[1].

A Development Plan Application was previously submitted in March of 2002, and subsequently withdrawn in December of 2003. An environmental assessment (Comprehensive Study Report or CSR), was also previously completed, and approved in December of 2002. An additional environmental assessment is now required due to variations between the revised Project and the previously approved Project.

The main potential environmental issues related to the marine portion of the proposed Project include impacts to: ecologically and biologically significant areas, marine protected areas, water quality, benthic organisms, marine mammals, fish and fish habitat, commercial fishing, birds, nearshore environment, marine soil quality, Species of Special Status, heritage resources, traditional use by Aboriginal persons and air quality. The main potential environmental issues related to the terrestrial portion of the proposed Project include impacts to: soil quality, Species of Special Status, vegetation, fresh water quality and quantity and watercourses and wetlands.

The NEB Member proposes recommendations related to: Species of Special Status, legacy munitions, EnCana's environmental plans and programs, traditional use by Aboriginal persons, the onshore route, watercourses and wetlands, the pipeline landfall installation methodology, contamination and/or acidic drainage, and abandonment/decommissioning.

The Commissioner proposes recommendations to the CNSOPB related to: participation in the Eastern Scotian Shelf Integrated Management (ESSIM) initiative, monitoring and the availability of monitoring results, consultation, measures to protect the Roseate Tern, compensation, greenhouse gas emissions, legacy munitions, and the Aboriginal Liaison position.

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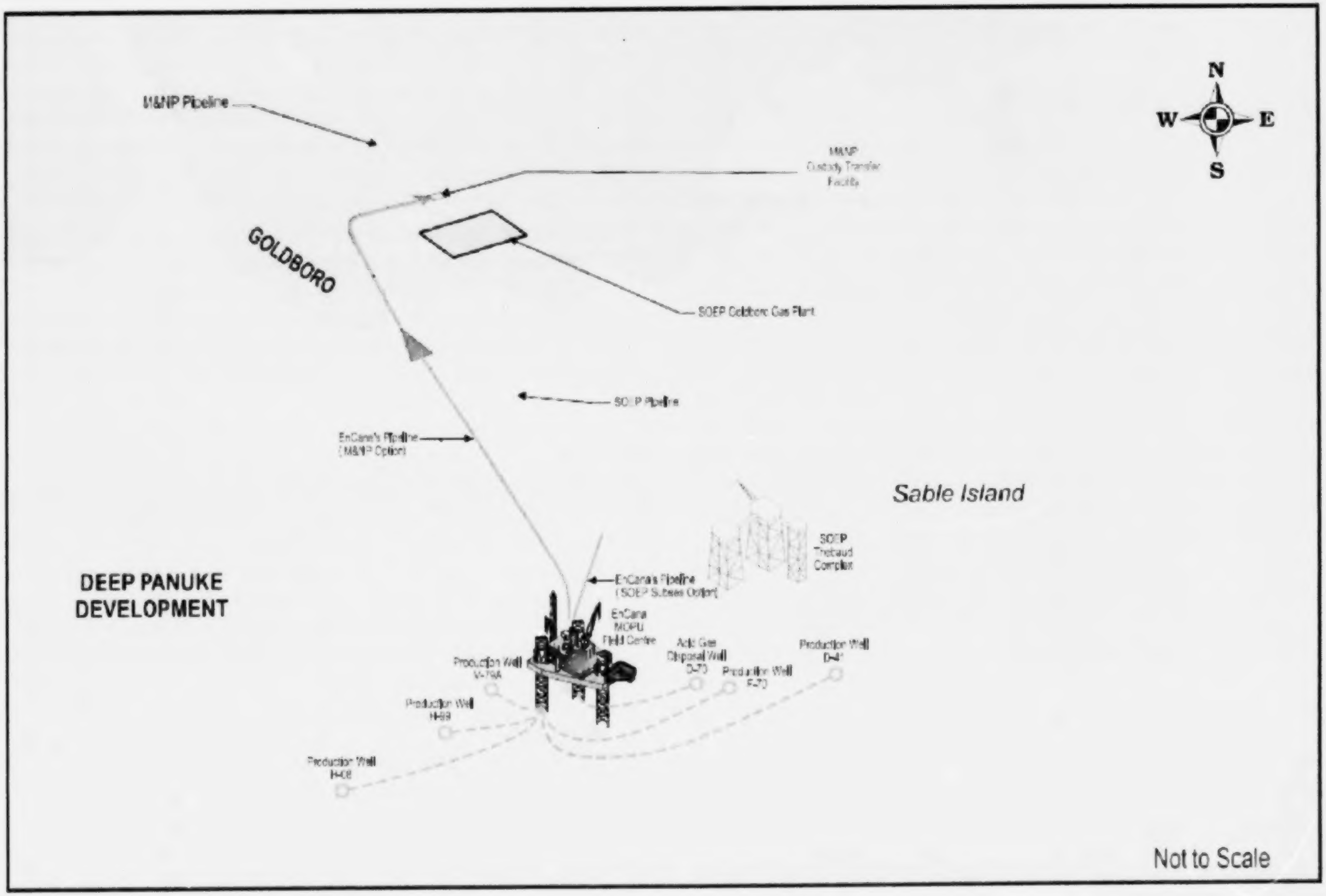
[1] Figure 1.1 Proposed Field Layout, from the Deep Panuke Offshore Gas Development: NEB Application, p.1-3.


M&NP Pipeline
M&NP
Custody Transfer
Facility
N
W
E
S
GOLDBORO
SOEP Goldboro Gas Plant
SOEP Pipeline
EnCana's Pipeline
(M&NP Option)
Sable Island
SOEP
Thebaud
Complex
EnCana's Pipeline
(SOEP Subsea Option)
DEEP PANUKE
DEVELOPMENT
EnCana
MOPU
Field Centre
Acid Gas
Disposal Well
D-70
Production Well
D-41
Production Well
F-70
Production Well
M-79A
Production Well
H-99
Production Well
H-08
Not to Scale

Information Sources

The analysis for this Joint Environmental Report is based on evidence submitted to the NEB and to the Commissioner.

This includes the following information from EnCana:

- 9 November 2006 Application to the NEB; including the Environmental and Socio-Economic Assessments (ESA) and the 2002 CSR
- 7 December 2006 Responses to NEB information request (IR) #1
- 11 December 2006 Responses to CNSOPB IR #1
- 20 December 2006 Responses to Commissioner IR #1
- 9 January 2007 Responses to NEB IR #2
- 12 January 2007 Responses to Commissioner IR #2
- 12 January 2007 Responses to CNSOPB IR #2
- 12 January 2007 Responses to CNSOPB IR #3
- 12 January 2007 Responses to EC IR #1
- 12 January 2007 Responses to DFO IR #1
- 12 January 2007 Responses to NRCan IR #1
- 26 February 2007 Reply Evidence
- 26 February 2007 Regulatory Applications – Addendum 1
- Responses to Intervenors IRs

The review also includes:

- Intervenor Written Evidence;
- Letters of Comments;
- Oral Statements presented during the Hearing; and
- Party Participation during the Hearing (see 5-9 March 2007 Hearing Transcripts, Volume 1 to 5)

To view this information, please refer to the Deep Panuke Coordinated Public Review Secretariat website at: www.deeppanukereview.ca.

This information is also available on the NEB website at: https://www.neb-one.gc.ca/ll-eng/livelink.exe?func=ll&objId=441384&objAction=browse&sort=-name
For more details on how to obtain documents, please contact the Secretary of the NEB at the address specified in Section 10.0 of this report.

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LIST OF ABBREVIATIONS

Accord Acts	*Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act* and *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act*
Agency	Canadian Environmental Assessment Agency
Assembly	Assembly of Nova Scotia Mi'kmaq Chiefs
CEA Act	*Canadian Environmental Assessment Act*
CNSOPB	Canada-Nova Scotia Offshore Petroleum Board
COM	Commissioner
Concurrency MOU	MOU on Effective, Coordinated and Concurrent Environmental Assessment and Regulatory Processes for Offshore Petroleum Development Projects in the Nova Scotia Offshore Area
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPAWS-NS	Canadian Parks and Wilderness Society, Nova Scotia Chapter
CSR	Comprehensive Study Report
DFO	Fisheries and Oceans Canada
DND	Department of National Defence
EA	Environmental Assessment
EAR	EnCana's Environmental Assessment Report
EBSA	Ecologically and Biologically Significant Area
EC	Environment Canada
EEMP	Environmental Effects Monitoring Plan
EnCana	EnCana Corporation
EPP	Environmental Protection Plan
ESA	Environmental and Socio-Economic Assessments
ESSIM	Eastern Scotian Shelf Integrated Management
FA	Federal Authority
FEAC	Federal Environmental Assessment Coordinator
Greyhawk	Greyhawk Ridge Minerals Inc.
HADD	Harmful alteration, disruption or destruction of fish habitat
HDD	Horizontal Directional Drilling
HRM	Halifax Regional Municipality
IC	Industry Canada
IR	Information Request
JDOP	Joint Directions on Procedure
JER	Joint Environmental Report
km	Kilometer

m	Meter
MARLANT	Maritime Forces Atlantic
MEK	Mi'kmaq Ecological Knowledge
Minister	Federal Minister of the Environment
mm	Millimeter
M&NP	Maritimes & Northeast Pipeline
MMscfd	Million standard cubic feet per day
MOPU	Mobile Offshore Production (or Processing) Unit
MOU	Memorandum of Understanding
MPA	Marine Protected Area
M&A	Myles and Associates
N/A	Non applicable
NAFO	Northwest Atlantic Fisheries Organization
NCNS	Native Council of Nova Scotia
NEB	National Energy Board
NRCan	Natural Resources Canada
NS	Nova Scotia
NSDOE	Nova Scotia Department of Energy
NSEL	NS Department of Environment and Labour
NSNR	NS Department of Natural Resources
OSEA	Offshore Strategic Energy Agreement
OTANS	Offshore Onshore Technologies Association of Nova Scotia
pH	Measurement unit for acidity level
Project	Deep Panuke Offshore Gas Development Project
RA	Responsible Authority
RoW	Right-of-Way
SARA	*Species at Risk Act*
SCC	Sierra Club of Canada
Scope	Scope of the EA for the proposed Project
Secretariat	Deep Panuke Coordinated Public Review Secretariat
SOEP	Sable Offshore Energy Project
SPANS	Seafood Producers Association of Nova Scotia
SPM	Suspended particulate matter
TC	Transport Canada
UXO	Unexploded ordnance
WWF-ARO	World Wildlife Fund Canada, Atlantic Region Office

PART I: DEEP PANUKE PROJECT

1.0 INTRODUCTION

On 9 November 2006, EnCana filed an application with the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) for its Deep Panuke Offshore Gas Development Project. This application was brought under section 143 of the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act* and section 136 the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act* (Accord Acts). Pursuant to sections 44 and 45 of the Accord Acts, EnCana has filed a Development Plan Application, Canada-Nova Scotia Benefits Plan, a Socio-Economic Impact Statement and an Environmental Impact Statement.

EnCana also filed an application with the National Energy Board (NEB) for a subsea and terrestrial pipeline associated with the proposed Project under the Part III of the *National Energy Board Act* (NEB Act) for a Certificate of Public Convenience and Necessity and an Order pursuant to Part IV of the NEB Act.

As part of both applications EnCana also filed an Environmental Assessment Report. The proposed Project triggers the *Canadian Environmental Assessment Act* (CEA Act) and requires that federal Responsible Authorities (RAs) prepare a Comprehensive Study Report (2007 CSR), separate from this report (See section 1.4: CEA Act Comprehensive Study Assessment).

1.1 2002 Application and Approved Comprehensive Study Report

The origins of this Project review go back to 2002 when in March of that year EnCana (then Pan-Canadian Energy Corporation) submitted its original applications for the Deep Panuke Project to the CNSOPB and NEB.

At that time the CNSOPB and NEB reached a Memorandum of Understanding (MOU) and established a coordinated public hearing and review process, and a Secretariat. However, in February 2003 prior to the oral hearing being held, EnCana requested a pause in the process and ultimately withdrew its application later in 2003.

As the 2002 Project also triggered the CEA Act at that time, the 2002 CSR was completed and approved by the federal Minister of the Environment (Minister) in December 2002.

1.2 MOU and Preparations for Revised Applications

In 2005, EnCana approached the CNSOPB with respect to its interests in the Deep Panuke Project, and in turn the CNSOPB reopened discussions with other federal agencies involved in the regulatory and environmental assessment aspects of the proposed Project, including the NEB. In anticipation of an eventual project resubmission by EnCana, on 19 February 2005, the CNSOPB, the NEB and other federal and provincial authorities entered into a Memorandum of Understanding on Effective, Coordinated and Concurrent Environmental Assessment and Regulatory Processes for Offshore Petroleum Development Projects in the Nova Scotia Offshore Area (Concurrency MOU). This agreement took into consideration that a joint process had already been established for the original Project and that an environmental assessment had already been completed for most of the proposed Project.

1.3 2006 Application and the Coordinated Public Hearing and Review Process

Following EnCana's 9 November 2006 applications, the CNSOPB appointed a Commissioner, pursuant to section 44 of the Accord Acts, to conduct a public review of the application and to make a report and recommendations to the CNSOPB. Similarly, pursuant to section 15 of the NEB Act, the NEB authorized one of its Members to take evidence and acquire the necessary information for the purpose of making a report and recommendations to the NEB.

Pursuant to the Concurrency MOU, and in order to avoid duplication and provide a single forum for the receipt of public comments and evidence respecting the proposed Project, the CNSOPB and the NEB signed a further MOU (CNSOPB-NEB MOU) setting out the framework for a single coordinated public regulatory review process (the Public Process).[2] This included the establishment of the current Deep Panuke Coordinated Public Review Secretariat (the Secretariat).

On 14 November 2006 the Commissioner and NEB Member released Joint Directions on Procedure (JDOP) that described in greater detail the Public Process to hear and consider the Applications. The Public Process included initial public consultation sessions, a written process for the exchange of evidence and information requests and responses, and an oral hearing. Further details are found in section 5.3 of this report.

The Commissioner and the NEB Member functioned jointly where possible and appropriate, to facilitate and coordinate the Public Process. The Commissioner and the NEB Member, however, did not constitute a "joint panel" under the CEA Act but rather maintained their separate assigned and independent regulatory roles.

1.4 CEA Act Comprehensive Study Assessment

In late August 2006 EnCana submitted a Project Description with the CNSOPB which formally initiated the federal Environmental Assessment (EA) coordination notification process under the CEA Act. Based on this notification the following federal authorities identified themselves as RAs under the CEA Act: Fisheries and Oceans Canada (DFO), Environment Canada (EC), Industry Canada (IC), Transport Canada (TC), the CNSOPB and the NEB. Natural Resources Canada (NRCan) identified itself as an expert Federal Authority (FA) and the Canadian EA Agency (Agency) took on the role of Federal EA Coordinator (FEAC).

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[2] 10 November 2006 Memorandum of Understanding between the CNSOPB and the NEB Concerning the Public Process for the Deep Panuke Project (CNSOPB-NEB MOU).

Based on the proposed Project Description and the differences between the original 2002 Project and the revised proposal, it was determined that the proposed Project would trigger a further Comprehensive Study level of assessment under the CEA Act. The above RAs are responsible for completing the 2007 CSR, separate from this report.

The revised proposal shares many similarities with the original proposal. Consequently, in preparing the new 2007 CSR, the previously approved 2002 CSR remains applicable and is to be relied on as appropriate. The scope of the EA for the proposed Project (Scope) and for the 2007 CSR is on the relevant changes since 2002 (see section 1.5: Scope of the Commissioner and NEB Member's Environmental Review).

Pursuant to the Concurrency MOU the CEA Act assessment was to run concurrently with and to the extent possible to be coordinated with the Public Process.[3] To reduce duplication and encourage the receipt of public comments and evidence though a single forum, RAs used the Public Process to request information and clarification from EnCana and as a means of collecting the views of the public to assist in the preparation of the 2007 CSR. To assist in this, the CNSOPB Commissioner and NEB Member have prepared this Joint Environmental Report (JER) for consideration by the RAs in preparing the 2007 CSR (see section 1.6: Purpose of the Joint Environmental Report).

The public will also have a period to examine the 2007 CSR, before it goes to the Minister for a final decision. The Agency will be responsible for the final 2007 CSR comment period, including publishing notices and directly notifying interested parties. Comments will be received by the Agency and will be publicly available. Following the Minister's decision, the NEB and CNSOPB will consider the 2007 CSR before issuing their authorizations on the proposed Project.

1.5 Scope of the Commissioner and NEB Member's Environmental Review

The JDOP lists the issues that were considered by the Commissioner and NEB Member. Listed among these as a joint issue is:

> "The potential environmental and socio-economic effects of the proposed facilities including those described in the Scope of the Environmental Assessment for the Comprehensive Study under the *Canadian Environmental Assessment Act*."

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[3] Further details on the CEA Act process and the planned coordination of it with the Public Process are outlined in the *Comprehensive Study Process for the Deep Panuke Offshore Gas Development Project* found on the http://www.deeppanukereview.ca internet website or the CNSOPB internet website http://www.cnsopb.ns.ca/environment/registry.html. Information can also be found on the Canadian Environmental Assessment Registry (CEAR) internet website located at www.ceaa-acee.gc.ca. The CEAR reference number for the Project is 06-03-21748.

The Scope was originally drafted by the CNSOPB and the other RAs, and underwent a three week public comment period from September 22 to October 13, 2006. Public comments were taken into consideration by the RAs when finalizing the Scope and making a recommendation to the Minister that the EA for the proposed Project continue as a comprehensive study. This was submitted to the Minister on 20 October 2006 who confirmed on 8 November 2006 that the EA for the proposed Project should continue as a comprehensive study. The final CEA Act Scope of the EA is available on the CEA Registry.

The Scope for the EA describes the scope of the proposed Project to be assessed, the factors to be considered and the scope of those factors. The Scope focuses on those aspects that vary from the 2002 CSR. This includes regulatory and policy changes since the original EA (e.g., the new *Species at Risk Act* (SARA) and the 2003 amendments to the CEA Act), significant changes in the environment, and any significant new information about the proposed Project's potential environmental effects.

1.6 Purpose of the Joint Environmental Report

Pursuant to the CNSOPB-NEB MOU, it was agreed that following the completion of the oral hearing, the Commissioner and the NEB Member would issue a JER within 30 days. The purpose of this report is several-fold:

- The Commissioner will submit the JER to the CNSOPB to provide the CNSOPB with a summary of public comments on the proposed Project and recommendations.
- The NEB Member will submit the JER to the NEB to provide the NEB with an environmental assessment based on the hearing record and including a summary of public comments, as a part of the final NEB Member's Report and Recommendations to the Board pursuant to section 15 of the NEB Act.[4]
- The JER will be forwarded to the other RAs by the CNSOPB, for the RAs to consider when preparing the 2007 CSR.

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[4] The NEB Section 15 Member's Report and Recommendations is to be submitted 60 days following completion of the oral hearing and will cover all relevant matters (i.e., supply, markets, engineering, etc.) for that portion of the proposed Project that is within NEB jurisdiction. As such the NEB Member's Report and Recommendations to the Board will include this JER, and the environmental assessment contained within, based on the evidence on the public record for the Deep Panuke hearing process that closed on 9 March 2007.

2.0 RATIONALE FOR THE PROPOSED PROJECT

As in the 2002 CSR, EnCana states that the primary purpose for the proposed Project is to allow EnCana to exercise its rights under, and obtain economic benefits from, the licence issued to it under the Accord Acts. Further, that the value of the Deep Panuke resources will be obtained by exploiting the opportunity presented by the considerable and growing demand for natural gas and other forms of energy in markets in Canada and the United States. Also, that the proposed Project will, therefore, provide further opportunity for Nova Scotians, and other Canadians, to participate in, and benefit from, the offshore oil and gas industry, thereby contributing to the economic growth of Nova Scotia and Canada.

3.0 DESCRIPTION OF THE PROJECT

3.1 Project under CNSOPB Jurisdiction

The Project's three main phases are:

- Development Phase (first quarter of 2005 – last quarter of 2010);
- Production Phase (8 to 17.5 years with a mean of 13 years; late 2010 – 2023); and
- Abandonment/Decommissioning Phase (end of service life).

The proposed Project involves production and processing of gas offshore and transport, via subsea pipeline, of market-ready gas to Goldboro, Nova Scotia to an interconnection with the existing Maritimes & Northeast Pipeline (M&NP) main transmission pipeline for further transport to markets in Canada and the northeast United States. The primary infrastructure for the proposed Project is the central offshore processing facility, known as the Mobile Offshore Production Unit (MOPU). A subsea pipeline will be used to transport sweetened natural gas to shore via one of the two options, the M&NP option or the Sable Offshore Energy Project (SOEP) subsea option. The former option is also under the jurisdiction of the NEB.

The Project will initially include completing four previously drilled wells and drilling two new wells, one production well and one acid gas injection well. All wells will have horizontal trees and will be tied back individually to the MOPU with subsea flowlines and control umbilicals. Up to three additional subsea production wells could be drilled after production start-up. The gas processing system will include inlet compression, separation, sweetening, dehydration, waste treatment and disposal, export compression and measurement.

Deep Panuke is considered a sour gas reservoir with raw gas containing approximately 0.18% H_2S, therefore, gas sweetening and processing equipment is required. Acid gas processing will be performed offshore through application of an amine unit to remove H_2S and some of the CO_2. Subsequent to its removal from the raw gas stream, the acid gas will be disposed into an acid gas injection well. The Deep Panuke Project will take advantage of existing infrastructure where possible.

3.2 Project under NEB Jurisdiction

<table>
<tr><th colspan="3">Physical Work and/or Activity related to the NEB's Project</th></tr>
<tr><td colspan="3">***Construction Phase – Timeframe:*** *2009- 2010*</td></tr>
<tr><td>Offshore Pipeline</td><td colspan="2">**Description of the facility**
▪ 173 km of 560 millimeters (mm) (or 22 inches) diameter pipeline
▪ Route paralleling the existing SOEP pipeline to shore
▪ Pipelines would be approximately 1 km apart except in the near shore area where they would be closer (between 8-100 m (meters) apart)
Site Preparation, Installation and Reclamation
▪ Nearshore and offshore pipeline installation activities are unchanged from the previously approved 2002 CSR[5]</td></tr>
<tr><td>Landfall
(Methodology to be determined following an HDD landfall feasibility assessment)</td><td>**Horizontal directional drilling (HDD)**
▪ Drilling an oversized hole from the shore to an offshore tie in point approximately 1 km offshore
▪ Pulling the pipeline from the pipelaying vessel (1 km offshore) through the drilling hole to the onshore drilling site</td><td>**Trenching**
▪ Landfall preparation
▪ Grading
▪ Potential blasting
▪ Open cut trench by floating equipment capable of digging in glacial till
▪ Pipeline pull-in from the pipelay vessel
▪ Single linear winch tied back to a temporary pile or a block anchor
▪ Mechanical backfilling the trench</td></tr>
<tr><td>Onshore Facilities and Pipeline</td><td colspan="2">**Description of the facilities**
▪ Approximately 3 km of onshore pipeline of 560 mm diameter pipeline
▪ Pig launcher/receiver facility
▪ Safety/emergency shutdown valve system
▪ Interconnection facilities with the existing M&NP facility (60m x 45m):
▪ Metering and quality measurement facilities
▪ Tie-in
Site Preparation, Installation and Reclamation
▪ Onshore pipeline installation activities are unchanged from the 2002 CSR[6]
▪ Access road may be required</td></tr>
</table>

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[5] For complete information on the previously assessed offshore pipeline installation activities refer to the 2002 CSR; Section 2.3.2 Subsea Pipeline.

[6] For complete information on the previously assessed offshore pipeline installation activities refer to the 2002 CSR; Section 2.3.3 Onshore Facilities and Pipeline.

Physical Work and/or Activity related to the NEB's Project
Operation Phase – Timeframe: *8 to 17.5 years* (mean of 13 years); *late 2010 - 2023*
▪ Sales gas would be routed to shore near Goldboro, NS, with a connection to the existing M&NP pipeline
▪ Pipeline capacity of 300 Million standard cubic feet per day (MMscfd)
▪ Maintenance Management System would incorporate proactive and predictive methods as well as intelligent condition monitoring techniques to manage onshore and offshore facility maintenance and inspection
▪ Periodic mechanical, electrical, instrumentation and general housekeeping maintenance on the onshore facilities
▪ Onshore vegetation management of the Right-of-Way (RoW) including post-construction revegetation efforts with native species, invasive species management and localizes low persistent and low ecological toxicity herbicide application
Abandonment/Decommissioning Phase[7] ***– Timeframe:*** *End of service life*

▪ Any environmental effects associated with the abandonment phase could be similar to those caused by the construction phase. Pursuant to the NEB Act, an application would be required to abandon the facility, at which time the environmental effects would be assessed by the NEB
▪ Decommissioning and abandonment of the proposed Project facilities will be performed in accordance with the regulatory requirements applicable at the time of such activities
▪ According to current practices:
  ▪ Above-ground onshore facilities would be removed and the land restored
  ▪ Buried onshore pipelines would be flushed, capped and abandoned in place
  ▪ Onshore Right-of-Way (RoW) would return to natural state
  ▪ Offshore pipeline would be degassed, degreased and cleaned

The following facilities and activities do not form part of the proposed Project under NEB review: the MOPU, drilling and exploitation of production and acid gas injection wells, subsea flowlines and control umbilicals, SOEP subsea option and gas processing system (compression, separation, sweetening, dehydration, export compression and measurement). Accordingly, the NEB Member Environmental Review (Part II) will not include an environmental impact assessment of these facilities and associated activities. Instead, these components of the proposed Project come under CNSOPB jurisdiction.

4.0 DESCRIPTION OF THE ENVIRONMENT

The following description of the environment includes information collected and presented in the 2002 CSR[8], as well as new information that has become available and has been included in EnCana's 2006 Application.

---

[7] See section 5.5.2 for more information on abandonment/decommissioning.

4.1 Marine Environmental Setting

Climatology

- Climate is typical of the offshore areas of NS:
    - Mean air temperature of 7.5 degrees Celsius
    - 1411 millimeters of average annual precipitation
    - Average wind of 18-32 km/hour primarily from west or southwest

Air Quality

- Offshore areas of NS have excellent air quality and low level of air pollutants

Oceanography

- Monthly range for mean and maximum significant wave heights are respectively: 1.3 to 3.4 meters and 4 to 11.8 meters
- Dominant current is a seasonally varying south-westerly flow along the Shelf edge. This Shelf edge current is predominant in all seasons, with a peak near-surface flow of 30 cm/s in the winter season, and lower rates during summer
- Partial clockwise gyre around Sable Island and Western Bank
- Occurrence of sea ice frequency is less than 1 percent at the proposed Project site

Water Quality

- Chemical composition of sea water includes: sodium, chloride ions, magnesium, sulphate ions, etc.
- Acidity level (pH) is relatively constant, ranging from 7.5 to 8.4
- Dissolved oxygen concentrations are likely to be at or near saturation
- Hydrocarbons arising are ever present in the marine environment and infrequent detectable amounts may be found due to illegal discharge
- No significant concentrations of polychlorinated biphenyls and various organohalogen pesticides

Sediment Quality

- NRCan and DFO have carried out a field program to determine impacts of historical mine tailings disposal on marine sediments and water in the Isaacs and Seal Harbour areas:
    - Unpublished data, in evidence, show sediments containing elevated levels of arsenic and mercury

---

[8] For complete information on the previously approved description of the environment refer to the 2002 CSR; Section 6.1 Ecological Setting, for the description of the marine and terrestrial environmental setting and Section 7.2 Socio-economic Context, for the socio-economic setting.

- Sampling from the Deep Panuke 2001 nearshore pipeline route survey found no evidence of contaminated sediments

Geology and Geomorphology

- Project site is mainly located on the Sable Island Sand and Gravel Formation, a fine coarse-grained, well sorted sand, grading laterally to very coarse, rounded gravel with rounded boulders

Benthos

- High diversity of benthic organisms
- Presence of various algae (e.g. red filamentous and coralline algae, sea grasses and saltmarsh grasses)
- Presence of associated fauna, such as:
    - Polychaetes (e.g. worms)
    - Nematoda (e.g. roundworms)
    - Crustacea (e.g. crabs, shrimps and lobsters)
    - Echinoidea (e.g. starfishes, urchins and sea cucumbers)
    - Bivalvia (e.g. clams and mussels)
    - Gastropoda (e.g. barnacles)

Fish

- 538 species of fish recorded in the Canadian Atlantic Region
- SARA listed species:
    - Threatened: Northern Wolffish and Spotted Wolffish
    - Special Concern: Atlantic Wolffish
- Species designation by Committee on the Status of Endangered Wildlife in Canada (COSEWIC[9]):
    - Endangered: Porbeagle Shark[10] and White Shark
    - Threatened: Cusk[11], Short-fin Mako and Winter Skate[12]
    - Species of Special Concern: Atlantic Cod and Blue Shark

---

[9] COSEWIC was established as an independent body of experts responsible for identifying and assessing species considered to be at risk. COSEWIC reports its results to the Canadian government and the public, and the Minister of the Environment's official response to the assessment results. Species that have been designated by COSEWIC may then qualify for legal protection and recovery under SARA.

[10] Pending public consultation for addition to the SARA listed species.

[11] Referred back to COSEWIC for further consideration.

[12] Pending public consultation for addition to the SARA listed species.

Sea Turtles

- Three species of sea turtle are known to occur in the Canadian Atlantic Region: Leatherback, Atlantic Loggerhead and Kemp's Ridley
- Species designation by COSEWIC:
    - Endangered: Leatherback Sea Turtle

Mammals

- 14 species of cetacean have been recorded
- Species designation by COSEWIC:
    - Endangered: Blue Whale and North Atlantic Right Whale and Northern Bottlenose Whale[13]
    - Species of Special Concern: Fin Whale, Humpback Whale and Harbour Porpoise

Birds

- Deep Panuke Project site includes both offshore and coastal habitats inhabited by a wide range of migratory and resident bird species
- SARA listed species:
    - Endangered: Roseate Tern
    - Special Concern: Barrow's Goldeneye, Harlequin Duck, Ivory Gull and Ipswich Sparrow
- Species designation by COSEWIC:
    - Endangered: Piping Plover

Other

- Sable Island is a federally protected area and is designated as a Migratory Bird Sanctuary administrated by the Canadian Wildlife Services under the *Migratory Birds Convention Act*
- Sable Gully (113 km from the MOPU) is a DFO designated Marine Protected Area (MPA)
- Country Island has been identified as a critical habitat for the Roseate Tern

---

[13] The Gully population.

4.2 Terrestrial Environmental Setting

Topography

- Predominantly hummocky with gently rolling ridges and valleys interspersed with flat coastal lowland plains and extensive bogs, open lakes and associated intermittent streams and bogs
- Landscape rises 50 to 75 meters from sea level within 1 meter of the shoreline and has regional elevation rising to 120 meters

Geology and Soils

- Relatively complex geological structure with highly to intensely fractured (highly faulted) bedrock
- Bedrock and surface material in the Goldboro area contain naturally elevated levels of arsenic associated with the abundant arsenopyrite
- Geological Survey of Canada has identified areas within the Goldboro Industrial Park that contain mine waste, containing high concentration of arsenic and mercury, from past gold-mining activities

Vegetation

- Vegetation in the onshore study corridor can be divided into four categories:
    - Forests: characterized by low species richness including: black spruce, balsam fir, tamarack and mountain white birch
    - Shrub thickets: dense tall shrub canopy (i.e. withered, false holly, downy alder and pin cherry) underlain by a well developed, low shrub understory (i.e. lambkill, blackberry, rhodora and Labrador tea)
    - Wetlands: (see Wetlands section)
    - Disturbed area:
        - Clear cuts are present over most of the southern portion of the onshore study corridor
        - Operating industrial facilities are present (and past construction activities took place) within the area, such as the SOEP gas plant and SOEP and M&NP pipelines
- 155 vascular plants species recorded in the onshore study corridor: 9 tree species, 36 shrubs species and 110 ground vegetation species

Wetlands

- Eight bogs are present in the onshore study corridor:
    - One large shore bog located on Betty's Cove Brook
    - Seven basin bogs
- One stream swamp along the shores of Betty's Cove Brook

Wildlife

- No mammal, reptile, or amphibian species at risk breeding in the onshore study corridor
- SARA listed species:
    - Special Concern: Short-eared Owl
- Bird Species designation by COSEWIC:
    - Species of Special Concern: Rusty Blackbird[14]
- Three species of bird are listed in the Atlantic Canada Conservation Data Center:
    - Northern Goshawk, Long-eared Owl and Barrow's Goldeneye

Fish and Freshwater Fish Habitat

- Three small streams and several intermittent or subsurface streams in the onshore study corridor
- Betty's Cove Brook is the only major watercourse, it is draining to Betty's Cove and then to Country Harbour
- SARA listed species:
    - Endangered: Atlantic Salmon[15]

Turtles

- Species designation by COSEWIC:
    - Species of Special Concern: Wood Turtle

4.3 Socio-Economic Setting

Demographics

- Total population of Nova Scotia in 2001 was 908,007, including:
    - Halifax Regional Municipality (HRM) with a population of 359,111.
    - The landfall portion of the proposed M&NP pipeline option is located in the vicinity of the Municipality of the District of Guysborough, population 5,165, and the Municipality of the District of St. Mary's, population 2,766.
    - On Reserve Aboriginal population of about 8,000 people from 13 Mi'kmaq First Nation Bands.
    - Off-reserve Aboriginal population of about 9,460 people.

---

[14] Pending public consultation for addition to the SARA listed species.

[15] The inner Bay of Fundy population.

Aboriginal Organizations

- The Assembly of Nova Scotia Mi'kmaq Chiefs (the Assembly) is the representative body for the thirteen Mi'kmaq First Nation Bands within the province of Nova Scotia and is represented in this regulatory process by the Union of Nova Scotia Indians[16] and The Confederacy of Mainland Mi'kmaq[17].
- The Native Council of Nova Scotia (NCNS) is an advocacy, services and programs organization that was founded in 1974 by the large community of Mi'kmaq/Aboriginal Peoples who continue to reside on traditional ancestral homelands throughout Nova Scotia (off reserve).

Land Use

- Onshore pipeline (M&NP option) portion of the proposed Project lies immediately to the east of Isaacs Harbour near the community of Goldboro, Nova Scotia.
- Project lies within the M-3 Zone known as the Goldboro Industrial Park. The M-3 Industrial Resource Zone has been designated specifically for oil refineries, petrochemical facilities, LNG facilities, gas processing facilities, power generation facilities, marine terminals and wind farms (Policy I-5(a)).
- No substantive recreational use of the area in the immediate vicinity of the proposed Project.

Traditional Land and Resource Use

- Mi'kmaq Ecological Knowledge (MEK) Study recently undertaken in support of an environmental assessment for the Keltic Petrochemicals Inc. proposed LNG and Petrochemical Facilities indicates current use of lands for traditional purposes (e.g., fishing, hunting, overnight camps) within the Goldboro Industrial Park. It is assumed for the purpose of this assessment that current use of lands for traditional purposes could occur in the study area for this Project.
- Total of 13 Aboriginal snow crab licences within Crab Fishing Area 24, held by Eskasoni First Nation, Chapel Island First Nation, Waycobah First Nation, Millbrook First Nation, Indian Brook First Nation, and the Native Council of Nova Scotia. In addition, a total of 10 shrimp licences are currently held by Chapel Island First Nation, Waycobah First Nation, Membertou First Nation, and Eskasoni First Nation.

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[16] The Union of Nova Scotia Indians is also a Tribal Council which provides advisory services to seven Mi'kmaq First Nation Bands: Acadia, Chapel Island, Eskasoni, Membertou, Shubenacadie, Wagmatcook and Waycobah.

[17] The Confederacy of Mainland Mi'kmaq is a Tribal Council which provides advisory services to six Mi'kmaq First Nation Bands: Paq'tnkek First Nation, Annapolis Valley First Nation, Bear River First Nation, Glooscap First Nation, Pictou Landing First Nation and Millbrook First Nation.

Heritage Resources

- Initial marine and terrestrial archaeological work in the area was undertaken for the SOEP. Three shipwrecks were identified in the immediate vicinity of the nearshore pipeline and landfall: Saladin (1844); Finchley (1884); and Foundation Masson (1975). This research also identified 16 cultural resources sites within the nearshore, landfall, and gas processing plant area. The sites range from reported pre-contact finds to twentieth century mining activities. Of these known sites, nine are within the vicinity of the proposed landfall and pipeline for this Project.
- Reported archaeological remains of First Nations activity in the general area of Goldboro and Isaacs Harbour are concentrated in well-sheltered environments within Isaacs Harbour, of which there are several.

Fishing

- For the years 2002 to 2005, there were 44 species commercially fished in the Northwest Atlantic Fisheries Organization (NAFO) Unit Areas which intersect with the proposed Project (4We, 4Wf and 4Wh) by the offshore commercial groundfish, pelagic and shellfish fisheries.
- Shellfish, specifically snow crab, scallops and northern shrimp, have dominated the catch in the Sable Island Bank area. In general, these catches occur mostly in Unit Area 4We, north of the proposed Project where the MOPU, subsea wells, flowlines and SOEP subsea option are located.
- Although the snow crab fishery is one of the most valuable fisheries in the area, snow crab habitat is primarily in gullies and in deeper areas along the Scotian Shelf and less so in the uniform habitat of the Sable Island Bank. Sea scallop catch has remained significant though variable in all three NAFO Unit Areas.
- Groundfish and pelagic species are caught mostly in Unit Area 4Wh, the main species being silver hake, herring and hagfish. Prospects for groundfish fishing on the eastern Scotian Shelf have not improved in recent years. Stocks of cod, haddock, white hake and cusk remain at very low levels and commercial bycatch is kept as low as possible.
- Nearshore commercial fisheries in the vicinity of the proposed Project (M&NP option) predominantly include lobster, sea urchin, rock crab and sea scallop.
- Offshore Clam Fishery Management Plan authorized a directed ocean quahog fishery on Sable Island Bank. This bivalve will be fished with use of a hydraulic dredge, and current plans are for Clearwater Seafoods Limited Partnership to begin harvesting in early 2007.
- Experimental sea cucumber fishery area has been identified as overlapping with the proposed export pipeline.

Aquaculture

- In Country Harbour there are currently five aquaculture leases and one new lease in the application process.

Military Use

- As noted in the 2002 CSR, Maritime Forces Atlantic (MARLANT) has designated operational training areas (Ops Areas) that cover the entire offshore region of Nova Scotia. The proposed pipeline routes traverse MARLANT Ops Areas I and J.

Employment and Income

- Median household income in 2000 was: $39,908 for Nova Scotia; $46, 946 for the HRM; $33,557 for the Municipality of the District of St. Mary's; and $28,634 for Guysborough.
- Unemployment rates in 2000 were: 11% for Nova Scotia; 7% for the HRM; and approximately 20% for Guysborough and St. Mary's.

Business and Industry

- Industries of the municipal districts of St. Mary's and Guysborough are primarily resource based. This includes fishery products processing and resource extraction.

5.0 CONSULTATION AND HEARING PROCESS

5.1 Consultation Conducted by EnCana

5.1.1 Public Consultation

EnCana conducted a consultation program between 2000 and 2002 as part of the process culminating in the environmental assessment and the submission, review, and Ministerial approval of the 2002 CSR. A diverse variety of groups and individuals participated, including nearshore and offshore fishing interests, local municipalities and regional development authorities, residents and businesses in the Guysborough County area, scientists, regulatory agencies, environmental non-governmental organizations, and the interested general public.

EnCana initiated a public consultation program in 2006 as part of regulatory requirements for the proposed Project. The objectives of the EA consultation program are summarized below:

- provide information, in a timely fashion, to the public and interested stakeholders about the proposed Project, with specific focus on Project modifications since the previous round of consultations;
- provide opportunities for the public to have input into the proposed Project to identify issues and concerns;
- provide early and adequate notice of these opportunities for involvement and input;
- obtain updated information on relevant stakeholder activities for Project planning;
- seek advice from the scientific community to enhance environmental management; and

- contribute to communications around EnCana activities and to the development of mutually constructive relationships with all EnCana stakeholders.

The 2006 consultation program for the preparation of the EA was largely conducted between July and October 2006, and consisted of the following three phases:

- Phase I: Stakeholder Identification and Preliminary Communications;
- Phase II: Consultation on the Proposed Project Description, Issues Identification and Scoping; and
- Phase III: Follow-up and Ongoing Communication.

The 2006 consultation program targeted a similar set of stakeholders as the previous process, but was also receptive to organizations that had not been previously consulted. The communications and consultation process involved various forms of interaction including electronic communication, phone contact and interviews, face-to-face interviews and meetings with individuals and small groups, group presentations and discussions, as well as public open houses in Isaacs Harbour and the town of Guysborough.

EnCana stated that it would continue to proactively communicate about the proposed Project with the public and interested stakeholders, provide supplementary information as part of this ongoing process, and pursue the development of mutually constructive relationships.

5.1.2 Aboriginal Engagement

EnCana's communications with Aboriginal groups sought to achieve two objectives. First, to establish relationships and initiate discussions with respect to the currently proposed Project and second, with respect to Aboriginal matters, to highlight the findings and conclusions of the 2002 CSR as well as EnCana's related commitments from its 2002 Project submissions. EnCana's current Aboriginal communication program (the Program) has been undertaken with the advice and recommendation of the Province of NS, with guidance from the Province's draft policy on consultations with the Mi'kmaq dated 14 June 2006.

The first phase of the Program was to identify the Aboriginal groups who may have an interest in the proposed Project and establish initial contact with such groups. Introductory letters were sent to the following organizations in July, 2006:

- each of the Chiefs of the thirteen (13) Bands in NS;
- the Confederacy of Mainland Mi'kmaq; and
- the Union of NS Indians.

EnCana received a reply from the Lead Negotiator for the Planning and Priorities Committee of the Assembly (Lead Negotiator), advising that the Lead Negotiator acts on behalf of the above organizations on consultations issues. EnCana replied to the Lead Negotiator advising, among other things, of a prior Technical and Ecological Knowledge survey carried out in an area where the Deep Panuke onshore pipeline is anticipated to be located and of EnCana's commitments to Aboriginal people in its 2002 CSR to include Aboriginal representatives in pipeline right-of-way inspections.

EnCana also consulted with the Maritime Aboriginal Aquatic Resources Secretariate (MAARS) with respect to potential fisheries interactions with the proposed Project. MAARS is an Aquatic Resources and Oceans Management Collaborative Management Body partnership of the Aboriginal Peoples Representative Organization Councils, including the NCNS, of the large communities of Mi'Kmaq, Malicite and Passamaquoddy Aboriginal Peoples continuing to reside off-reserve throughout the Maritime Region on the East Coast.

Following its correspondence to the Lead Negotiator and the Chief of the NCNS, EnCana has maintained its communications with the Lead Negotiator and the Chief through written correspondence, and email and telephone communications. EnCana has committed to advance these matters by keeping Crown and Aboriginal representatives informed of matters related to Deep Panuke, and by facilitating ongoing consultations between those parties.

5.2 Consultation Conducted by Nova Scotia Department of Energy

Recognizing the potential for infringement of Aboriginal or treaty rights that exist with a project of the nature and scope of Deep Panuke, the Province of NS made efforts to inform itself of this concern.

The NS Department of Energy (NSDOE) contacted the thirteen First Nations communities in NS and has coordinated consultations with the Kwilmu'kw Maw-klusuaqn (Mi'kmaq Rights Initiative) negotiation office on behalf of the Assembly of NS Mi'kmaq Chiefs, the collective voice of the thirteen First Nations. The consultations have included discussions of potential infringement of existing and claimed Mi'kmaq rights, Aboriginal title, and mitigation action taken by the Proponent. On two occasions, representatives from NRCan were in attendance and participated in these meetings.

NSDOE has also communicated directly with the NCNS, on behalf of the large community of Mi'kmaq/Aboriginal Peoples who continue to reside on traditional ancestral homelands (off-reserve) throughout NS, with respect to issues and concerns relating to the proposed Project.

In addition to the foregoing, NSDOE has engaged in discussion with the Mi'kmaq regarding education, training and business opportunities that may exist on the proposed Project and in the energy industry in general. Specifically, there have been discussions with respect to the Offshore Strategic Energy Agreement (OSEA) funds. The focus going forward would be to consider an ongoing working group, or a committee that would look specifically at the benefits for both organizations.

5.3 Description of the Coordinated Hearing and Review Process

As noted in section 1.3 the Public Process to hear and consider the Applications involved:

- initial public consultation sessions;
- a written process for the exchange of evidence and information requests;
- intervenors' information sessions; and
- an oral hearing held in Halifax between 5 and 9 March, 2007.

Initial public consultation sessions were held in Halifax and Guysborough on the 27 and 29 November 2006 respectively. These consultation sessions were to:

- hear submissions on the list of issues;
- receive oral comments on the proposed Project; and
- provide information on the Public Process and on how the public could participate in the hearing.

In addition, to assist intervenors in better understanding the hearing process and participating more effectively, further information sessions for intervenors and other members of the public were held in Halifax and Guysborough on 16 and 17 January 2007 respectively.

The Public Process provided for a number of different ways by which members of the public could have input. These included filing a letter of comment, providing an oral statement at the oral hearing, or participating as an intervenor.

The letter of comment option was intended to allow interested persons who did not wish to appear at the oral hearing, an opportunity to provide their views and opinions on the proposed Project in writing prior to the oral portion of the hearing. Letters of comment were not sworn or tested by cross-examination.

The oral statement option was intended to allow interested persons who did not wish to intervene, an opportunity to address the Commissioner and NEB Member at the oral hearing. Oral statements were made under oath or affirmation and the Commissioner, the NEB Member, EnCana, and any other party with leave, were allowed to ask questions of the person making the statement.

The option to intervene was for those interested persons who wished to participate fully in the entire public hearing. Intervenors were afforded the most rights and responsibilities. Intervenors and their evidence were sworn in and subject to cross-examination by any other party.

A Government Participant option was also provided to allow those Federal Authorities and provincial agencies with an environmental assessment responsibility, the opportunity to participate and carry out their CEA Act responsibilities without becoming full intervenors.

In addition, the public were invited to attend the oral hearing.

5.4 Parties Having Raised Issues or Provided Comments

The following subsections and tables set out which parties provided input to the Public Process and whether their comments pertained to the Commissioner's (COM) and CNSOPB portion of the proposed Project, or the NEB's (NEB) portion of the proposed Project (export pipeline), or both (COM/NEB). Comments that are not directed at a specific aspect (Commissioner's and CNSOPB or NEB portions) of the proposed Project (e.g. comments of an administrative nature) are identified as not applicable (N/A).

5.4.1 Intervenors

Registered Intervenors	Comments filed or participation during:			
	CEA Act Scope	**List of Issues**	**IRs**	**Hearing**
Canadian Association of Petroleum Producers				
ExxonMobil Canada Ltd.			NEB	COM/NEB
Guysborough County Regional Development Authority	COM/NEB	COM/NEB	COM/NEB	COM/NEB
Imperial Oil Resources				COM/NEB
Keltic Petrochemical Inc.		NEB		
Maple LNG Ltd.			NEB	
Maritimes & Northeast Pipeline Management Ltd.				COM/NEB
Municipality of Guysborough	COM/NEB	COM/NEB		
Municipality of the County of Richmond				
Myles and Associates (M&A)	COM/NEB	COM/NEB		COM/NEB
Native Council of NS (NCNS)	COM/NEB	COM/NEB	COM/NEB	COM/NEB
NS Chambers of Commerce		COM/NEB		
NS Department of Energy (NSDOE)				COM/NEB
NS Power Incorporated				
Offshore Onshore Technologies Association of NS (OTANS)			COM/NEB	COM/NEB
Seafood Producers Association of NS (SPANS)		COM/NEB	COM/NEB	COM/NEB
Shell Canada Limited				COM/NEB
Sierra Club of Canada (SCC)		COM/NEB		COM/NEB
Strait-Highlands Regional Development Agency				
Strait of Canso Superport				COM/NEB
The Confederacy of Mainland Mi'kmaq		COM/NEB		COM/NEB
Town of Port Hawkesbury				
Union of NS Indians		COM/NEB		COM/NEB
United Association Local 244				

5.4.2 Government Participants

Government Participants	IRs relative to:
NRCan	COM/NEB
DFO	COM/NEB
EC	COM/NEB

5.4.3 Oral Statement Providers

Oral Statement Providers	Comments filed relative to:
Canadian Parks and Wilderness Society, NS Chapter (CPAWS-NS)	COM/NEB
Greyhawk Ridge Minerals Inc. (Greyhawk)	NEB

5.4.4

5.4.5 Letter of Comment Providers

Letter of Comment Providers	Comments filed relative to:
CPAWS-NS	COM/NEB
Greyhawk Ridge Minerals Inc.	NEB
Kevin McAllister	NEB
NS Department of Environment and Labour (NSEL)	N/A[18]
TC	N/A[19]
World Wildlife Fund Canada, Atlantic Region Office (WWF-ARO)	COM/NEB

5.5 Common Key Issues

Some parties provided comments and made requests to both the Commissioner and NEB Member on some broad issues which may be better acknowledged jointly here, rather than separately in Parts II and III of this JER.

5.5.1 EnCana's Two Export Pipeline Options

With respect to the export pipeline, EnCana has requested that both the SOEP subsea option and the M&NP option be approved at this time. EnCana's two Applications correctly reflect the partial overlap in jurisdictions for these two options: the CNSOPB having jurisdiction over both options, whereas the NEB having jurisdiction over only the M&NP option.

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[18] Includes potential NSEL approval requirements under the NS *Environment Act*.

[19] Includes TC mandate, responsibilities and approval requirements.

EnCana submitted that it requires approval of both options since it is still working to determine which option is most suitable based on technical and commercial terms. It noted that it has not yet completed its due diligence to confirm the useful life of the SOEP line. EnCana's position is that neither option would result in significant adverse environmental effects.

Some parties expressed concern over the environmental impacts of the M&NP export pipeline option in light of an already existing SOEP pipeline. They also challenged the request for approval of both options, taking the position that the much shorter subsea option is the only appropriate option from an environmental point of view. SPANS expressed concerns about environmental impacts and potential harm to the fisheries related to the M&NP export pipeline option. M&A also expressed concerns about impacts to the marine environment related to the M&NP export pipeline option (as opposed to the SOEP option). NCNS questioned how both options could be approved when there wasn't full information on both options. SCC noted the reduced environmental impacts of the shorter SOEP option including either the reduced costs of removal or reduced impacts of permanent abandonment in place. SCC's cross-examination indicated that it understood EnCana's wish for both options so as to not undermine its negotiating position with ExxonMobil over access to the SOEP pipeline option. However, SCC stated that this should be of no concern to the Commissioner and NEB Member.

CPAWS-NS noted that the SOEP subsea option could result in increased use of the SOEP pipeline and that additional impact due to accidents and malfunctions should be considered and addressed by EnCana.

5.5.1.1 Views and Recommendations of the Commissioner and NEB Member

The Commissioner and NEB Member note that, subject to minor modifications, the M&NP option is essentially the same as that reviewed in the approved 2002 CSR. While the application for the SOEP pipeline is new, its identification as an alternative was reviewed in the 2002 CSR and no parties presented evidence or clarified how the application for it now alters the 2002 CEA Act determination of significance.

With respect to the NEB, it has before it an application for the M&NP option only. Should EnCana ultimately choose to proceed with the SOEP option, at that time the owners of the SOEP line (rather than EnCana) would have to apply for an exemption under section 58 of the NEB Act for the necessary interconnection with the SOEP pipeline.

While it would appear that the better option from an environmental perspective would be to build the shorter line, in the absence of a full assessment of the condition of the existing SOEP pipeline, it would not be prudent to limit EnCana's options at this stage. The Commissioner and NEB Member encourage EnCana to give meaningful consideration to the relative environmental impacts of the two options in its ultimate weighing of its options, and to explain its decision to all stakeholders.

5.5.2 Abandonment/Decommissioning

EnCana stated that a key request critical to the success of its Project is that it be permitted at the time of decommissioning to abandon *in situ* the export pipeline, in-fields flowlines and umbilicals. It submitted that this is consistent with established industry practices around the world and represents the best option based on safety, environmental, technical and cost considerations. EnCana cited the CNSOPB approval of the SOEP project on the basis that the pipeline would remain *in situ*. Removal of pipe from deep water is technically possible but not commercially viable. It would require physically unburying the line and undertaking a diving program to cut the lines and concrete coating into manageable pieces. EnCana submitted this would present increased safety risk to personnel, be expensive, and not result in any environmental advantage while instead possibly resulting in at least some short term impacts. It added that at the time of decommissioning it would follow the latest industry and regulatory best practices. EnCana elaborated that the cost of removal is a risk to the economic viability of the proposed Project and that consequently it needs at least approval in concept to remove any cost uncertainty in order for the proposed Project to proceed.

In turn SPANS requested that all subsea equipment on or in the seafloor be removed following the end of the life of the proposed Project. This was requested in order to remove the potential hazard to fishing gear. SPANS further noted that fishing activity may increase in the future. Alternatively SPANS argued that the type of abandonment should be addressed at the abandonment stage and not now.

SCC argued that industry practice and capabilities with respect to pipeline abandonment may change considerably in the 7-17 year life of the proposed Project and that pre-approval of EnCana's abandonment plan should not be granted.

5.5.2.1 Views and Recommendations of the Commissioner and NEB Member

The Commissioner and NEB Member acknowledge EnCana's position with respect to current industry practices and acknowledge the concerns of SPANS and SCC. They note that, the costs and risks associated with abandonment and decommissioning are dependent on the circumstances existing at the time of decommissioning, and that EnCana has committed to adhering to regulatory requirements at that time. The costs and risks will also depend on which pipeline option is selected.

With respect to NEB authorization for abandonment of the M&NP export pipeline option, paragraph 74(1)(d) of the NEB Act requires that EnCana would have to apply to the NEB at that time. The NEB would give due consideration to all relevant factors and circumstances, including the environment, at that time. To this end, recommended NEB condition **K** would provide information that would assist in monitoring the object of SPANS' concerns, as well as ensure pipeline safety. NEB condition **K** would help inform any eventual decision on abandonment, including abandonment *in situ* or other variations such as removal of pipeline portions identified as being responsible for known problems associated with a change in the environment.[20]

At this time it is recommended that no decision on abandonment be rendered.

5.5.3 Public Process

SCC submitted that the process did not serve the environmental assessment function well in that environmental assessment should encourage full public participation and evaluation of a Project within the policy frameworks of the federal and provincial governments. The legal nature of the process with very formal procedural and evidentiary protocols made the process daunting and made meaningful public input difficult if not impossible. SCC requested that the regulators recommend that this dual regulatory and EA experiment, not be allowed to take place again in the future. The regulatory and EA processes are very different with respect to requirements for public participation.

SCC further submitted that procedural limitations have narrowed the EA function of this process to the point where the intent of the CEA Act has been undermined. The scope of the factors to be considered by the EA as set out in the Scope document directs the EA to take into account any significant changes in the environment and any significant new information relating to the environmental effects of the proposed Project. SCC expressed the view that the Agency may need to conduct further studies to fulfill requirements deemed outside the scope of the current process.

CPAWS-NS submitted that a more effective and successful process would better facilitate all levels of public participation, making it more feasible from a capacity perspective and less complicated. Public participation is a very important and necessary aspect of the EA process, but it cannot be effective if no one, or very few, are actually able or willing to participate.

SPANS submitted that the people in the fishing industry are not being listened to because the process tends to be fairly lengthy, complex and difficult.

NCNS submitted that the process was unfavorable to some participants and raised concerns about the order of cross-examination. NCNS also acknowledged that the Commissioner and NEB Member have been fair by allowing this process to be open and comments to come in.

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[20] The matter of abandonment will also be addressed in portion of the NEB Section 15 Member's Report and Recommendations.

5.5.3.1 Views and Recommendations of the Commissioner and NEB Member

The Commissioner and NEB Member recognize that public involvement is a fundamental component of the EA process necessary in order to address both biophysical and socio-economic impacts.

The Commissioner and NEB Member note the public was given an opportunity to participate in the Public Process in a variety of ways, including: the original 2002 CSR process; comments on the scope of the new EA; public consultation sessions in Halifax and Guysborough regarding the Public Process; information sessions in Halifax and Guysborough to help explain the Public Process; and the ability to participate by letter of comment, oral statement or as an intervenor. They further note that the CEA Agency awarded participant funding to the NCNS, CPAWS-NS, SPANS and SCC to support participation in the EA of the proposed Project.

The Commissioner and NEB Member acknowledge and appreciate the time and effort the public devoted to the process. The Commissioner and NEB Member have taken into consideration comments from the public in assessing the proposed Project. For example, in reviewing the environmental effects of the proposed Project, the Commissioner and NEB Member used an issue-based approach, which relied on the identification of issues by both technical experts and by people who could be affected by the pipeline.

The Commissioner and NEB Member note that one of the purposes of the JER is to forward information to the other RAs, for the RAs to consider when preparing the 2007 CSR. To reduce duplication and encourage the receipt of public comments and evidence though a single forum, RAs used the Public Process to request information and clarification from EnCana and as a means of collecting the views of the public to assist in the preparation of the 2007 CSR. The Commissioner and NEB Member further note that the public will also have a period to examine the 2007 CSR, prior to the Minister's decision.

The Commissioner and NEB Member are of the view that the Public Process has allowed the opportunity for public participation in the environmental assessment.

Finally, the Commissioner and NEB Member would remind parties that the purpose of both project regulatory reviews and EAs are to examine and evaluate a proponent's proposal. Notwithstanding parties' views expressed at the Hearing, these processes are not necessarily either appropriate nor the most effective forums in which to debate broader government policies.

PART II: NEB MEMBER ENVIRONMENTAL REVIEW

6.0 METHODOLOGY

The purpose of Part II of the JER is to provide an EA for that portion of the proposed Project that is within NEB jurisdiction, based on the evidence on the public record for the Deep Panuke hearing process, including public comments. The NEB Member has reviewed all the evidence on the record and has given due consideration to all public comments raised throughout this proceeding. The comments and concerns that relate to the potential environmental and socio-economic effects of the proposed Project have been considered in the preparation of this JER.

In addition, the NEB Member received comments on a number of other matters. Those comments that relate to matters that may be more appropriately considered under the NEB Act will be addressed in the final NEB Member's Report and Recommendations[21] and will cover all relevant matters (i.e., supply, markets, engineering, etc.) for that portion of the proposed Project that is within NEB jurisdiction.

An evaluation of EnCana's consultation program undertaken pursuant to the guidelines set out in the NEB's Filing Manual, including but not limited to consultation activities related to environmental matters, will also be included in the final NEB Section 15 Member's Report and Recommendations.

In assessing the environmental effects of the proposed Project, the NEB Member used an issue-based approach. In section 7.0 the NEB Member tabulates environmental concerns raised by participants in the Public Process and identifies interactions expected to occur between the proposed Project activities and the surrounding environmental elements. The last column in the table provides references for where further assessment information can be found on any one matter, either in the 2002 CSR, or in 8.1 for standard mitigation measures, or in section 8.2 for a more detailed assessment.

Section 8.1: Standard Mitigation Measures provides a summary analysis for those potential adverse environmental effects that are normally resolved through the use of standard design or routine mitigation measures. In these cases, mitigation measures are outlined or explanations are provided as to why mitigation measures are not required.

Sections 8.2: Detailed Analysis of Potential Adverse Environmental Effects provides a detailed assessment and evaluation for each potential adverse environmental effect which is of public concern, involves non-standard mitigation measures, monitoring, or requires the implementation of an issue-specific recommendation. The analysis describes mitigation measures, ratings for evaluation criteria, monitoring, views of the NEB Member and any issue-specific recommendations. The key areas for which the NEB Member provides more detailed assessment cover: watercourses and wetlands; nearshore environment; contamination; Species of Special Status

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[21] Refer to footnote number four for additional information on this report.

(federal, provincial, territorial and local); commercial fishing industry; traditional use by Aboriginal persons; and legacy munitions.

- Section 8.3 addresses cumulative effects.
- Section 9.0 lists the NEB Member recommendations regarding the proposed Project.
- Section 10.0 provides NEB contact information.

7.0 PROJECT - ENVIRONMENT INTERACTIONS AND PUBLIC COMMENTS

	Environmental Element	Comment Providers	Summary of the Comments and/or Description of Interaction	Reference for Further Assessment
Bio-Physical	Marine Environment	▪ SPANS	▪ Concerns relative to environmental impacts and potential harm to the fisheries resulting from the M&NP export pipeline option	▪ See 2002 CSR; Table 6.32 ▪ See section 5.5.1 of Part I
		▪ M&A	▪ Concerns relative to marine environment impacts resulting from the M&NP export pipeline option (as opposed to the SOEP option)	
		▪ SCC	▪ Concerns relative to ocean floor disruption resulting from the M&NP export pipeline option (as opposed to the SOEP option)	
		▪ WWF-ARO ▪ CPAWS-NS ▪ SCC	▪ Concerns relative to Ecologically and Biologically Significant Areas (EBSAs) ▪ Concerns relative to ESSIM ▪ Concerns relative to Marine Protected Areas (MPAs)	▪ See 2002 CSR; Table 6.38 ▪ See standard mitigation; Table 8.1
		▪ Guysborough County Regional Development Authority	▪ Concerns relative to Eastern Scotian Shelf Integrated Management (ESSIM)	
	Marine Water Quality		Decrease in marine water quality from: ▪ Installation of subsea infrastructure ▪ Hydrostatic testing ▪ Remaining presence of abandoned subsea structures ▪ Accidental spills	▪ See 2002 CSR; Table 6.28 ▪ See standard mitigation, Table 8.1
	Marine Benthos		Disturbance of benthic organisms and loss of benthic habitat from: ▪ Installation of subsea equipment ▪ Sedimentation nearshore and offshore	▪ See 2002 CSR; Table 6.30

	Environmental Element	Comment Providers	Summary of the Comments and/or Description of Interaction	Reference for Further Assessment
	Marine Mammals	▪ SCC	▪ Concerns relative to the effect of noise on marine mammals	▪ See 2002 CSR: Table 6.34
			Disturbance of marine mammals and loss of habitat from: ▪ Installation of subsea equipment ▪ Vessel traffic ▪ Noise increase ▪ Presence of structures (possible attraction)	
	Marine Fish and Marine Fish Habitat	▪ WWF-ARO	▪ Concerns relative to the impacts of the proposed Project on Groundfish communities (including cod and haddock) of the Eastern Scotian Shelf ▪ Concerns relative to impacts on the fish larvae diversity in the Scotia-Fundy region	▪ See 2002 CSR: Table 6.32 ▪ See standard mitigation, Table 8.1
			Disturbance of marine fish and loss of habitat from: ▪ Installation of subsea equipment ▪ Hydrostatic testing ▪ Accidental gas release	
	Marine Birds		Disturbance of marine birds from: ▪ Noise increase ▪ Accidental spills	▪ See 2002 CSR: Table 6.36 ▪ See standard mitigation, Table 8.1
	Nearshore Environment	▪ Guysborough County Regional Development Authority	▪ Concerns about the pipeline landfall methodology, relative to: ▪ Legacy contaminants ▪ Suspension of sediment in the water	▪ See detailed assessment on Effects on the Nearshore Environment, Table 8.2.2 ▪ See detailed assessment on Disturbance of Contamination, Table 8.2.3

	Environmental Element	Comment Providers	Summary of the Comments and/or Description of Interaction	Reference for Further Assessment
	Soil Quality		- Effect of soil and sediment legacy contamination	- See detailed assessment on Disturbance of Contamination; Table 8.2.3
	Species of Special Status: federal (Species at Risk), provincial, territorial and local	- CPAWS-NS	- Concerns relative to the Winter Skate - Concerns relative to monitoring program	- See detailed assessment on Effects on Species of Special Status; Table 8.2.4
		- NCNS - SCC	- Concerns relative to all the Species at Risk in the proposed Project area - Specific concern relative to Winter Skate	
	Terrestrial Vegetation		Loss of vegetation resulting from: - construction activities - accidental pipeline rupture; fuel or hazardous material spills	- See 2002 CSR; Table 6.40 - See standard mitigation; Table 8.1
	Fresh Water Quality and Quantity		Decrease in fresh water quality resulting from: - Erosion and sedimentation during construction	- See 2002 CSR; Table 6.40 - See standard mitigation; Table 8.1 - See detailed assessment on Effects on Watercourses and Wetlands Functions; Table 8.2.1
	Watercourses and Wetlands		Effects on watercourse and wetland function from: - Habitat loss or alteration during construction or operation - Sedimentation into wetlands during construction - Erosion increase - Pipeline rupture - Fuel or hazardous material spills	- See 2002 CSR; Table 6.40 - See standard mitigation; Table 8.1 - See detailed assessment on Effects on Watercourses and Wetlands Functions; Table 8.2.1

	Environmental Element	Comment Providers	Summary of the Comments and/or Description of Interaction	Reference for Further Assessment
	Terrestrial Wildlife and Wildlife Habitat	▪ CPAWS-NS	▪ Concerns relative to onshore wildlife and wildlife habitat	▪ See 2002 CSR; Table 6.40 ▪ See standard mitigation; Table 8.1
			Disturbance or displacement of terrestrial wildlife and loss of habitat resulting from: ▪ Noise and human presence increase ▪ Habitat loss or alteration during construction ▪ Increase access during operation ▪ Accidental vehicle collisions ▪ Pipeline rupture ▪ Fuel or hazardous material spills	
	Air Quality	▪ SCC	▪ Concerns relative to air emissions (greenhouse gas) resulting from construction and operation of the pipeline ▪ Concerns relative to air emissions resulting from the use of gas by end users	▪ See 2002 CSR; Table 6.26 ▪ See detailed assessment on Cumulative Effects – Air Emissions, Table 8.2.8
			Decrease in air quality: ▪ Air emissions from vessel, power generation, and construction equipment during construction ▪ Accidental release of market-ready gas	
Socio-Economic	Human Occupancy/ Resource Use	▪ SPANS ▪ Strait of Canso Superport Corporation Limited	▪ Potential effects on the commercial fishing industry ▪ Potential effects on fish stocks (refer to the "Marine Fish and Marine Fish Habitat" section for additional details)	▪ See detailed assessment on Effects on the Commercial Fishing Industry, Table 8.2.5 ▪ See sections 5.5.1 and 5.5.2 of Part I
		▪ Municipality of the District of Guysborough ▪ MapleLNG Limited	▪ The location of EnCana's onshore pipeline may constrain the location and operation of the proposed Keltic/Maple facilities	▪ See standard mitigation; Table 8.1

	Environmental Element	Comment Providers	Summary of the Comments and/or Description of Interaction	Reference for Further Assessment
	Heritage Resources	▪ Assembly of NS Mi'kmaq Chiefs (via NSDOE)	▪ Construction could interact with previously unidentified heritage resources and / or with identified heritage resources	▪ See standard mitigation; Table 8.1
	Traditional Land and Resource Use	▪ Native Council of NS ▪ Assembly of NS Mi'kmaq Chiefs ▪ NSDOE	▪ Construction activities could result in effects on the current use of lands and resources for traditional purposes by Aboriginal persons, such as hunting, fishing, trapping, gathering	▪ See detailed assessment on Effects on Traditional Use by Aboriginal Persons; Table 8.2.6
	Human Health/Aesthetics	▪ M&A	▪ The potential human health effects associated with military dumpsites of chemical, biological and nuclear agents off the East Coast of Canada	▪ See detailed assessment on Disturbance of Legacy Munitions; Table 8.2.7
Other	Accidents/Malfunctions	▪ ExxonMobil Canada Ltd. ▪ Shell Canada Limited ▪ Imperial Oil Resources	▪ Physical damage and/or rupture of the existing adjacent SOEP pipeline (especially where the existing SOEP pipeline and EnCana's proposed M&NP option pipeline would only be approximately 8m apart) resulting from construction activities or potential spanning during the operation of the pipelines	▪ See standard mitigation; Table 8.1 ▪ See section 5.5.2 of Part I
		▪ Municipality of Guysborough	▪ Concern relative to the selection of the onshore route and potential interaction with the adjacent Goldboro Industrial Park	
		▪ Guysborough County Regional Development Authority	▪ Concern relative to potential interaction between adjacent projects ▪ Concerns relative to pipeline routing and the separation distance between adjacent projects	

	Environmental Element	Comment Providers	Summary of the Comments and/or Description of Interaction	Reference for Further Assessment
	Accidents/Malfunctions (continued)	▪ SPANS ▪ SCC	▪ Concerns relative to interaction between subsea structures and fishing activities and equipments	
		▪ M&A	▪ Concerns relative to potential (marine) environment and marine life effects related to the presence of sites containing legacy munitions or unexploded ordnance, biological or chemical warfare agents and radioactive materials off the East Coast of Canada	▪ See detailed assessment on Disturbance of Legacy Munitions; Table 8.2.7
	Cumulative Effects	▪ CPAWS-NS ▪ SCC	▪ Concerns relative to climate change	▪ See 2002 CSR; Section 6.3.9 ▪ See detailed assessment on Cumulative Effect – Air Emissions; Table 8.2.8
		▪ NCNS	▪ Concerns relative to impacts resulting from air emissions	

8.0 POTENTIAL ADVERSE ENVIRONMENTAL EFFECTS

8.1 Standard Mitigation Measures

The following Table provides a summary of potential adverse environmental effects to be mitigated through standard mitigation measures and itemizes what those measures are.

To avoid duplication, the Table focuses on the new (or modified) mitigation measures that were not included in the approved 2002 CSR. Refer to Appendix 1 for complete information on commitments from the previously approved 2002 CSR.

Potential Adverse Environmental Effect	Proposed Standard Design or Mitigation Measures
Effect on EBSAs (related to the ESSIM Initiative)	▪ Evaluation of the potential interactions of the proposed Project with offshore planning processes, specifically the ESSIM initiative ▪ EnCana's active involvement in the ESSIM process would help ensure that Project activities take place in the larger context of integrated ocean management planning and activities of other ocean users ▪ Recent zoning initiatives have not identified key ecological areas that would be impacted by the proposed Project and as such, the proposed Project is not expected to represent an obstacle to developing appropriate zoning options
Decrease in marine water quality	▪ The export pipeline would be hydrostatically tested during commissioning using treated seawater which would be drawn from a location near the landfall site in Goldboro for the pipeline to shore for the M&NP export pipeline option
Disturbance of marine fish and loss of habitat	▪ Consultations with DFO and Environment Canada regarding harmful alteration, disruption or destruction of fish habitat (HADD) and Disposal at Sea permits, respectively, would occur as part of the CEA Act environmental assessment process
Disturbance of marine birds	▪ EnCana would review the results of the current Environmental Studies Research Fund study of effects of oil sheens on birds once they are published and implement any required changes to the Environmental Protection Plan (EPP)
Loss of vegetation	▪ Vegetation along watercourses would be monitored during operation
Decrease in fresh water quality	▪ Post construction monitoring of erosion protection methods ▪ Monitoring of site runoff and stream flow during construction and operation if acid drainage risk is identified during the geotechnical program ▪ Water quality monitoring (TSS, acid drainage and contaminated sediments) ▪ All construction activities would be inspected and monitored to ensure that erosion and control structures are appropriately installed and maintained ▪ Follow-up would be conducted after clean up activities to accurately evaluate habitat restoration and the success of stream bank protection and stability ▪ Following the determination of the final crossing location and method, water quality would be monitored for total suspended solids (TSS) at each stream crossing ▪ General assessment of the post-construction conditions in affected wetlands and watercourses

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

Potential Adverse Environmental Effect	Proposed Standard Design or Mitigation Measures
Effects on watercourse and wetland function	▪ EnCana is currently in discussion with landowner(s) to finalize the routing of the proposed onshore pipeline (and location of associated onshore facilities) and would make every reasonable effort to minimize interactions with wetlands or other sensitive onshore environmental features ▪ If wetland habitat must be disturbed, a wetland evaluation would be undertaken ▪ EnCana would ensure that existing drainage patterns in wetlands are maintained as feasible, during construction and operation ▪ All machinery would be washed and inspected before arriving on site to minimize potential for transfer of invasive plant species ▪ A buffer zone of natural vegetation would be maintained on either side of streams and would be removed at the crossing location immediately before instream works, thus minimizing the time that soils are exposed ▪ Grubbing in wetlands would occur immediately prior to installation of the pipeline ▪ Trench blocks would be installed to prevent water from draining into or out of wetlands via the buried pipeline. Substrate would be preserved, if feasible, where wetland restoration on the RoW is proposed ▪ In the case of dry crossing of watercourses, a fish salvage program would be undertaken by qualified biologists to remove all fish from the affected section of stream. Fish would be removed by seine nets and/or with the aid of an electrofisher and released downstream of the crossing ▪ Local work areas would be sited as far as reasonably possible from wetland and aquatic habitats ▪ No Project related vehicles would be driven through wetlands or watercourses. Codes of practice around these sensitive habitats would be described in the Project EPP ▪ All culverts and temporary and permanent stream diversions associated with the proposed Project works would allow for fish passage. ▪ The area of disturbance would be limited to that which is absolutely necessary to complete the proposed Project. ▪ A wet weather shut down policy would be in place and would include the minimum precipitation level which would trigger response measures.
Disturbance or displacement of terrestrial wildlife and loss of habitat:	▪ Prior to construction, detailed terrestrial and fish habitat surveys would be conducted along the onshore pipeline RoW to evaluate the present status of terrestrial and aquatic plant and animal communities. ▪ Special attention would be directed at identifying any rare or sensitive flora and fauna within the onshore pipeline RoW
Location of EnCana's onshore pipeline may constrain the location and operation of the proposed Keltic/Maple facilities	▪ Operating within the administrative and zoning requirements of the Goldboro Industrial Park, the EnCana M&NP option pipeline would be built in an area zoned for industrial development. The Project is compatible with the Municipal Planning Strategy and the intended use of the land ▪ To avoid possible interference with other planned developments in the Industrial Park, EnCana would locate the pipeline within a pipeline corridor approved by the Municipality of the District of Guysborough ▪ EnCana would develop a process / protocol to consult with all affected landowners regarding construction activities in the near-shore, landfall and on-shore pipeline corridor areas

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

Potential Adverse Environmental Effect	Proposed Standard Design or Mitigation Measures
Disturbance to, or destruction of, heritage resources	▪ Known marine archaeological sites would be avoided ▪ Davis Arcaheological Consultants Limited has conducted a review of information from past archaeological investigations in and near the proposed Deep Panuke Natural Gas pipeline landfall location near Goldboro, and determined that First Nations resources are unlikely to be present in the area. EnCana has committed to inviting Aboriginal groups to review the applicability of previous Mi'kmaq land use / professional opinions including the Davis opinion ▪ EnCana would have the onshore pipeline RoW inspected by an archaeologist, in association with an Aboriginal representative, after the survey line is marked and prior to initiation of any ground disturbing activities ▪ A professional archaeologist and Aboriginal representative would monitor onshore and nearshore marine pipeline construction. Monitoring would involve direct observations during onshore earthworks and review of underwater videotapes and examination of borehole samples taken in the nearshore marine pipeline landfall area. The detailed scope and arrangements for this monitoring would be developed at the earliest possible opportunity (i.e., when videotapes/borehole samples are available) prior to commencement of pipeline construction activities. If a site is encountered, work would be halted and the NS Museum would be contacted ▪ A professional archaeologist and an Aboriginal representative would be on call during subsea pipeline construction; if a previously unidentified wreck or subsea archaeological site is encountered, work would be halted and the Curator of Special Places at the NS Museum would be contacted ▪ Delivery of a heritage resource awareness program for construction personnel
Physical damage and/or rupture of the adjacent SOEP pipeline	▪ A detailed quantitative risk analysis considering potential risk synergies between the nearshore/onshore components of the proposed Project with the Keltic Petrochemical Inc. / Maple LNG Ltd. Project would be undertaken during detailed route design ▪ While laying in close proximity to the SOEP pipeline, a temporary exclusion zone would be set up to eliminate the risk of damage, in addition, if an anchored vessel is used and if the anchor cables cross the SOEP pipeline, a buoy would be placed on the anchor cable, if required, to prevent the cable from falling onto or damaging the SOEP pipeline should the cable break
The approved 2002 CSR and EnCana's Environmental Plans and Programs (such as the Environmental Protection Plans, the Environmental Effects Monitoring Plan (EEMP) and the Compliance Monitoring Plan) specify further details on standard mitigation.	

Subject to the forthcoming 2007 CSR, the NEB Member is of the view that for this proposed Project, if EnCana follows the above-mentioned standard design and mitigation measures, these potential adverse environmental effects would not be significant.

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

8.2 Detailed Analysis of Potential Adverse Environmental Effects

The following subsections provide a detailed assessment and evaluation for each potential adverse environmental effect which:

- is of public concern; or
- involves non-standard mitigation measures, monitoring, or requires the implementation of an issue-specific recommendation.

The analysis describes mitigation measures, ratings for evaluation criteria, monitoring, views of the NEB Member and any issue-specific recommendations. Refer to Appendix 2 for definitions for the criteria used in the effects evaluation.

8.2.1 Effects on Watercourses and Wetland Functions

Background/Issues	**Presence of Environmentally Sensitive Features in the Onshore Corridor** In the 2002 CSR, EnCana made the commitment that the onshore pipeline route would avoid environmentally sensitive areas such as wetlands and Betty's Cove Brook. In the 2006 EA Report EnCana states that the final onshore routing has not been finalized and that EnCana would make every reasonable effort to minimize interactions with wetlands or other sensitive onshore environmental features. During the Hearing EnCana confirmed that negotiations with the Municipality of Guysborough to determine the onshore route are still ongoing and that EnCana has been looking at a potential re-routing of the existing corridor in the interest of minimizing any impact to wetlands. **Watercourses and Wetlands Crossing Methodology** In IR response EC-ECA-1.26 to EC, EnCana stated that HDD is not being considered to mitigate impacts to wetlands, for technical and economic reasons. Evaluations would be conducted for each wetland potentially affected by the proposed Project and would be completed in accordance with the NSEL Operational Bulletin Respecting the Alteration of Wetlands (March 2006) and the Wetland Designation Policy (March 2006).
Mitigation Measures	▪ See standard mitigation; Table 8.1 ▪ Where wetlands cannot be avoided through final pipeline routing: ▪ Vehicle use in wetlands would be required for pipeline installation. ▪ Vehicle traffic would be limited to necessary machinery and work room. ▪ Access roads and laydown areas would be organized, where feasible, to minimize impacts from equipment movement and material storage. ▪ Instream work or any work within 30 m of a watercourse would be restricted to the period between June 1 and September 30 of each year. ▪ All streambeds and streambanks influenced by proposed construction work would be restored as soon as possible following disturbance. ▪ EnCana committed to endeavour to avoid disturbing identified areas containing contaminated soils within the lands provided by the Municipality taking into account other environmental, technical and cost constraints.
Monitoring	▪ A Compliance Monitoring Plan would be developed prior to commencement of any construction activity. ▪ EnCana would implement post-construction monitoring programs and compensation. ▪ EnCana's Environmental Plans and Programs: the Environmental Protection Plans, the

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

	EEMP and the Compliance Monitoring Plan, would specifies further details on mitigation. See Recommendations **C**, **F** and **G.**
Views of the NEB Member	Should the proposed Project receive regulatory approval, the NEB Member recommends that the following conditions (Recommendation **E** and **H**) be imposed: **E**. EnCana shall file with the Board, at least 45 days prior to construction, the detailed onshore route selected by EnCana. The detailed onshore route shall describe the following elements: a) alternative routes considered and the reasoning for the onshore route selected; b) measures and actions taken by EnCana to avoid any sensitive features (e.g. for breeding birds or species of conservation concern), sensitive habitats and identified areas containing contaminated soils when finalizing the selection of the onshore route; and c) presence and nature of sensitive features, such as watercourses and wetlands, sensitive habitats, as well as identified areas containing contaminated soils within the disturbance footprint of the Onshore Project. EnCana shall not deviate from the selected route without prior approval from the Board. **H.** If watercourses or wetlands are present within the selected onshore route, EnCana shall file with the Board for approval, at least 45 days prior to construction, an assessment which provides EnCana's wetland and watercourse crossing method and rationale for the decision. The assessment to support the preferred and applied for crossing method shall include, but is not limited to, the following elements: a) a detailed description of the wetlands and watercourses to be crossed; and b) a comparative review of the different potential wetland and watercourse crossing methods, including Horizontal Directional Drilling (HDD), comprising information on: i. technical feasibility; ii. potential environmental effects, including lost of ecological functions; and iii. estimated relative costs.
Effects Evaluation	Frequency: Low Duration: Short to Medium term Reversibility: Reversible Geographical Extent: Local/Area Magnitude: Medium
NEB Member Recommendation	Subject to the findings of the 2007 CSR, the NEB Member is of the view that with the implementation of the recommended conditions and EnCana's proposed measures; any potential adverse environmental effects on watercourses and wetlands are not likely to be significant.

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

8.2.2 Effects on the Nearshore Environment

Background/Issues	**Suspended Particulate Matter in the Marine Environment** The 2002 CSR states that trenching would result in localized increases in suspended particulate matter (SPM) in waters immediately surrounding the trench. The nature and duration of elevated levels of SPM are primarily a function of the physical characteristics of the sediment (i.e., coarse material would settle quickly, and fine grain material over a longer period). In addition, blasting may be required for trenching. HDD methodology would include collection and disposal of drill cuttings in an approved area onshore. Therefore, HDD inputs of sediments into the marine environment would be limited to potential minor sedimentation during any break out and HDD bore day-lighting, which may include escape of small amounts of water-based drilling mud. In summary, HDD is expected to have negligible effects, if any, on fish habitat or fisheries. **Contaminated Suspended Particulate Matter in the Marine Environment** Results of a survey completed for EnCana in 2001 along the proposed pipeline route found no evidence of contaminated sediments from past mining activities in the nearshore Goldboro area, thus re-suspension of native sediments is unlikely to expose lobsters, sea urchins and other marine life to harmful levels of potential contaminants. See detailed assessment on Effects of soil and sediment legacy contamination (Table 8.2.3) for more information on contamination and acidic drainage. **Technical Feasibility** An initial review shows that the substrate to be drilled by the HDD technique is bedrock, potentially with fractures and complex geology. EnCana and its pipeline contractor would need to further look at site specific geotechnical data for the landfall area to determine the variability of the geology, degree of fracture and rock hardness to be drilled using the HDD technique. In addition, EnCana stated that HDD installation "may well encroach on Keltic (Keltic Petrochemical Inc.), or Maple's (Maple LNG Ltd.) landholding".
Views of the Parties	Guysborough County Regional Development Authority requested that horizontal directional drilling be utilized to install the pipeline.
Views of EnCana	EnCana stated that the use of HDD as a nearshore installation alternative is currently under review and evaluation, and that the decision would be made in either late 2007 or early 2008. EnCana also stated that an analysis of the directional drilling option would compare technical feasibility, potential environmental effects, and costs of this method against those of seabed trenching and backfilling for the nearshore installation Nonetheless, EnCana submitted that HDD is a viable option, subject to validating the rock or the substrate condition. EnCana also confirmed it intends to complete an HDD feasibility assessment in the future as part of the proposed Project planning.
Mitigation Measures	EnCana's Environmental Plans and Programs: the Environmental Protection Plans, the EEMP (including the verification of the absence of species of special concern) and the Compliance Monitoring Plan, would specifies further details on mitigation. See Recommendations **C**, **F** and **G**.
Views of the NEB Member	Prior to completion of an intrusive geotechnical investigation and completion of the HDD feasibility study it is premature to determine if the HDD landfall method and its contingency methods are appropriate and what mitigation measures would be required. Should the proposed Project receive regulatory approval, the NEB Member recommends that the following condition (Recommendation **I**) be imposed: EnCana shall file with the Board for approval, at least 45 days prior to construction, an HDD landfall feasibility assessment, which provides EnCana's landfall pipeline proposed

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

<table>
<tr><td></td><td>installation method and rationale for the decision. This assessment shall include the following elements as a minimum:
a) a comparative review of the different potential landfall pipeline installation methods;
b) geotechnical and construction feasibility assessments performed by persons with subject expertise to support the preferred and applied-for landfall pipeline installation method;
c) reports on environmental impacts studies as completed;
d) reports on geotechnical studies as completed; and
e) a hazard analysis and contingency measures completed for the selected installation method.
Assuming that HDD is feasible, the NEB Member notes that this installation method would serve as a mitigation measure in substantially reducing potential impacts to the sensitive nearshore environment. As such EnCana is encouraged to use this method if feasible.</td></tr>
<tr><td>Effects Evaluation</td><td><table><tr><td>Frequency</td><td>Duration</td><td>Reversibility</td><td>Geographical Extent</td><td>Magnitude</td></tr><tr><td>Low</td><td>Short term</td><td>Reversible</td><td>Local/Area</td><td>Medium</td></tr></table></td></tr>
<tr><td>NEB Member Recommendation</td><td>Subject to the findings of the 2007 CSR, the NEB Member is of the view that with the implementation of the recommended condition and EnCana's proposed measures; any potential adverse environmental effects on the nearshore environment are not likely to be significant.</td></tr>
</table>

8.2.3 Disturbance of Contamination

Background/Issues	**Legacy Contamination** EnCana's 2006 EA Report indicates that there is new data available on the contamination of soil from past mining activities and that a Geotechnical Testing Program would be conducted to identify potential areas of contamination and/or acidic drainage. Potential contaminated sites have been identified near the Project corridor in the environmental impact assessment report prepared for the Keltic Petrochemicals Inc. proposed liquefied natural gas and petrochemical plant. Disturbance of these contaminated soils could result in a re-suspension or a relocation of contaminants into the environment, including soil and groundwater, and could also result in a potential spread of the contamination. EnCana acknowledged that it is subject to the applicable laws respecting this matter, and, for greater certainty, accepted that it would be responsible for both cost and remediation clean-up in the event that its Project related activities result in contamination or disturbance of existing legacy contamination. **Acidic Drainage** EnCana mentioned during the proceeding that "the Board's proposed condition respecting the reporting and remediation of acidic drainage is less stringent than what EnCana has proposed in its Application. EnCana proposes to adhere to the *Sulphide Bearing Material Disposal Regulations* which have been promulgated under the *Environment Act* of NS. There is a fair measure of experience in the Province of NS in dealing with acidic slate and it requires a more immediate response than suggested by the Board in that proposed

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

	condition”.
Mitigation Measures	▪ EnCana committed to endeavour to avoid disturbing identified areas containing contaminated soils within the lands provided by the Municipality of Guysborough taking into account other environmental, technical and cost constraints. ▪ EnCana would test soils along the easement, and in the case of elevated levels of contamination, a detailed site assessment would be carried out to determine the extent and nature of contamination that could reasonably be affected by EnCana’s activity. ▪ Stream crossings in acid drainage risk areas and/or areas contaminated by past mining activities would be monitored for surface water quality throughout the life of the proposed Project ▪ EnCana would manage all contaminated materials according to regulatory requirements and standard practices depending on the level and type of site contaminants. ▪ EnCana would minimize encounters with acid bearing rock through routing and avoidance. ▪ A geotechnical study would be conducted to identify potential acidic bedrock areas, providing the basis for mitigation. M&NP’s Acid Rock Drainage Construction Response Plan and Guidelines for Development on Slates in NS (NSDOE and Environment Canada, 1991) would be consulted as well as applicable regulations. ▪ EnCana would adhere to the *Sulphide Bearing Material Disposal Regulations* under the *Environment Act* of NS.
Views of the NEB Member	Should the proposed Project receive regulatory approval, the NEB Member recommends that the following condition (Recommendation **J**) be imposed: If contamination or acidic drainage is encountered during the Geotechnical Testing Program along the easement: a) EnCana shall file with the Board, at least 14 days prior to the commencement of the remediation: i. detailed description of the extent and nature of the contamination or acidic drainage encountered; ii. a detailed site assessment; iii. a remediation plan; and iv. evidence of consultation with relevant regulatory authorities that confirms satisfaction of the proposed remediation plan and associated mitigation. b) EnCana shall commence remediation within a year of encountering contamination. The NEB Member recognizes the knowledge and jurisdiction of the departments of NS regarding acidic drainage and is satisfied that condition **J**, as revised, would provide an opportunity for all relevant regulatory authorities to review and comment on the remediation methodology for acidic drainage, including timing. The NEB Member notes that should contamination be encountered and that consequently remediation is implemented this could result in a beneficial clean-up of the local environment.

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

Effects Evaluation	Frequency	Duration	Reversibility	Geographical Extent	Magnitude
	Low	Short to Medium term	Reversible	Local/Area	Medium
NEB Member Recommendation	Subject to the forthcoming 2007 CSR, the NEB Member is of the view that with the implementation of the recommended condition and EnCana's proposed measures; any potential adverse environmental effects resulting from the disturbance of contaminated materials are not likely to be significant.				

8.2.4

8.2.5 Effects on Species of Special Status

Background/Issues	The proposed Project has the potential to adversely affect Species of Special Status and their habitat, either through disturbance or direct mortality. The majority of impacts can be expected to be related to disturbance of the species. **SARA Species:** ▪ Endangered: Roseate Tern and Atlantic Salmon[22] ▪ Threatened: Northern Wolffish and Spotted Wolffish ▪ Special Concern: Atlantic Wolffish, Barrow's Goldeneye, Harlequin Duck, Ivory Gull, Ipswich Sparrow and Short-eared Owl **Species designation by COSEWIC:** ▪ Endangered: Porbeagle Shark[23], White Shark, Leatherback Sea Turtle, Blue Whale, North Atlantic Right Whale, Northern Bottlenose Whale[24] and Piping Plover ▪ Threatened: Cusk[25], Short-fin Mako and Winter Skate[26] ▪ Species of Special Concern: Atlantic Cod, Blue Shark, Fin Whale, Humpback Whale, Harbour Porpoise, Rusty Blackbird[27] and Wood Turtle **Migratory Bird:** ▪ Greater Yellowlegs **Surveys** In the 2002 CSR EnCana committed (and reaffirmed in 2006) to undertake a detailed habitat survey along the onshore pipeline route once the final route has been determined. In the event that Species at Risk are identified within the pipeline route, the appropriate regulatory authorities would be contacted by EnCana to discuss the proposed course of action.

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[22] The inner Bay of Fundy population.

[23] Pending public consultation for addition to the SARA listed species.

[24] The Gully population.

[25] Referred back to COSEWIC for further consideration.

[26] Pending public consultation for addition to the SARA listed species.

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

Mitigation Measures	- EnCana's terrestrial field surveys would be conducted in the pipeline corridor for wetlands (if applicable), breeding birds and Species at Risk (i.e., rare plants, birds, herpetiles and mammals). - Surveys would be conducted by experienced field biologists in accordance with methodologies previously used and approved by NS Department of Natural Resources (NSNR) and the Canadian Wildlife Service (CWS) after consultation with experts from these agencies prior to conducting the surveys. - The results of the surveys would be used to refine mitigative measures and monitoring requirements with respect to the final pipeline routing. Should the survey results determine that the pipeline would impact sensitive onshore resources; the proposed mitigation would be reviewed to determine its adequacy. - EnCana's Environmental Plans and Programs: the Environmental Protection Plans, the EEMP (including the verification of the absence of species of special concern) and the Compliance Monitoring Plan, specifies further details on mitigation. See Recommendations **C, F** and **G.** - EnCana committed to making environmental effects monitoring results publicly available and supports the archiving of environmental monitoring data in a regional database.
Views of the Parties	CPAWS-NS, NCNS, SCC and SPANS all expressed concerns relative to Species at Risk, as well as specific concerns with regard to the Winter Skate, a Threatened COSEWIC species pending public consultation for addition to the SARA listed species. SCC indicated that "declines in several indicators from the new information available suggest that there are increased concerns for the status of this resource" (i.e. the Winter Skate).
Views of EnCana	EnCana mentioned during the proceeding that the Winter Skate is found in the Gulf of St. Lawrence, from Newfoundland to Cape Hatteras, in depths of one to 371 meters. EnCana does not predict any significant impact on this species nor any other fish species on this portion of the Sable Bank, given the very small footprint of this facility, the characterization of the discharges and emissions from the proposed Project. EnCana confirmed that the verification of the absence of species of special concern included in the proposed Monitoring Effects Monitoring Plan would apply to COSEWIC listed species pending public consultation that could potentially lead to them being listed under the *Species at Risk Act*.
Views of the NEB Member	The NEB Member is of the view that relevant regulatory authorities must have an opportunity to review and comment on the proposed methods for the survey and applicable mitigation measures; and that special attention is to be directed to Species with Special Status that have previously been observed in the proposed Project area. To that effect, should the proposed Project receive regulatory approval, the NEB Member recommends that the following condition (Recommendation **A**) be imposed: EnCana shall file with the Board, at least 14 days prior to construction, a detailed breeding bird and nest survey. The survey shall include: a) a special attention directed at locating: i. SARA listed species (such as the Short-eared Owl); ii. species currently considered for inclusion to the SARA list (such as the

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[27] Pending public consultation for addition to the SARA listed species.

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

<table>
<tr><td></td><td colspan="5">Rusty Blackbirds); and
iii. migratory birds (such as the Greater Yellowlegs).
b) evidence to confirm that relevant regulatory authorities had an opportunity to review and comment on the proposed methods for the survey;
c) the results of the survey; and
d) if applicable, evidence of consultation with relevant regulatory authorities, such as NS Department of Natural Resources and Environment Canada, regarding satisfaction with the proposed mitigation measures.
In the event that Species at Risk (rare plants, birds, herpetiles and mammals) are identified within the M&NP export pipeline route, the NEB Member expects EnCana to consult with relevant regulatory authorities, as well as include the relevant mitigation measures in the appropriate environmental plans and programs.</td></tr>
<tr><td>Effects Evaluation</td><td>Frequency
Low</td><td>Duration
Short term</td><td>Reversibility
Irreversible</td><td>Geographical Extent
Immediate</td><td>Magnitude
Medium</td></tr>
<tr><td>NEB Member Recommendation</td><td colspan="5">Subject to the findings of the 2007 CSR, the NEB Member is of the view that with the implementation of the recommended condition and EnCana's proposed measures; any potential adverse environmental effects on Species of Special Status or their habitat are not likely to be significant.</td></tr>
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8.2.6 Effects on the Commercial Fishing Industry

Background/Issues	Commercial fisheries and aquaculture are considered important for local and regional economies. Potential Project interactions include interference with fishing activity or effects on fish stocks. Adverse effects on commercial fisheries and aquaculture may affect fishing and aquaculture costs, fish landings and aquaculture productivity and, thus, revenues and profitability. Changes to commercial fisheries since the 2002 CSR include changes in catch levels, targeted species, fisheries management and markets. There are several Project design changes that may change the nature of the interactions between commercial fisheries and the proposed Project (e.g., changes in operations include a longer production period, which would increase the temporal boundaries for interaction with fisheries). Changes to the nearshore fisheries since the 2002 CSR include variations in harvest levels.
Mitigation Measures	During the construction phase, a *Notice to Mariners* would be issued to advise all ship captains of EnCana's schedule and areas of activity. In addition, EnCana would communicate this information directly to managers of fishing organizations to facilitate fisheries planning. This would include liaising with the fishing industry and research survey programs on the routing of vessels to minimize the potential for damage to fishing or survey equipment including gear or vessels. EnCana would place fishing industry observers strategically on key construction vessels (e.g., the pipelay vessel) to further mitigate interaction with the fishing vessels. The export pipeline would be buried in areas where mobile bottom fishing gear is historically most used. Specifically, the portions of the M&NP option pipeline contained between KP0 to KP22 and KP110 to the MOPU would be buried to a depth of approximately one meter. No pipeline construction activities would take place in the nearshore area during the lobster fishing season (April 19 – June 20). If blasting is required for pipeline installation, it would be conducted in accordance with

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

	all applicable regulations. For identified lobster fishermen in the nearshore and for a sea urchin harvester in the nearshore, EnCana recognizes that if it proceeds with the M&NP option, there would be effects and, for that reason, EnCana is prepared to compensate these licensed fishery participants for the losses, including potential loss of income, which they may suffer during construction and thereafter until the nearshore area recovers to its preconstruction state. EnCana has committed to compensate and indemnify licensed participants in the fishing industry to the extent that the Deep Panuke Project may cause them damage or loss including consequential damages during normal fishing operations. The export pipeline is designed to withstand impacts from conventional mobile fishing gear in accordance with DNV *Guideline No. 13, Interference between Trawl Gear and Pipelines*, September 1997.
Monitoring	EnCana has proposed an Environmental Effects Monitoring Program, and it has committed to make the results of that program public.
Views of the Parties	SPANS submitted that potential impacts should encompass any hindrance to the continuation of established activity in the general area of the proposed Project, including: • damage to fishing vessels and gear; and • impacts on the marine resources, whether those impacts are from spills, unauthorized discharges or authorized discharges. SPANS further submitted that other than proximity to clams, groundfish and possibly scallops, the proposed Deep Panuke Project and its infrastructure would not be placed where there is or may be significant fishing activity. If it were, the overall nature and content of the fisheries industry's response to the proposed Project and/or what may be included in an agreement would be substantially different in nature. SPANS has proposed recommendations, including: • an agreement between EnCana and offshore fisheries interests as a condition of authorization; and • all pipelines, flowlines and umbilicals be trenched at a minimum depth deeper than one (1) meter everywhere current technology permits trenching, be monitored yearly or more frequently when they are in place and be maintained in this state as long as they remain in place; Strait of Canso Superport Corporation Limited recognized the importance of the fishing industry to rural communities in NS, particularly Guysborough County, and encouraged EnCana to minimize pipeline footprint and spacing and utilize the best practices available to minimize environmental impacts.
Views of EnCana	EnCana is currently evaluating the potential risk of interaction with the hydraulic clam dredge to be used by the new Clearwater vessel to harvest ocean quahogs. The results of this study would be communicated with the Board and with the fishing industry as part of EnCana's regular consultation. If the results of this study indicate the dredge was a lot heavier or of a dimension that would exceed the Det NorskeVeritas guideline, then EnCana would contact the fishing operator immediately, discuss potential mitigation, and incorporate this into its EPP. EnCana would conduct annual surveillance of the pipeline and associated infrastructure to monitor all subsea equipment. EnCana is firm in its position that it would be inappropriate to enter into a bilateral agreement with SPANS and the interests which it represents regarding compensation, since SPANS does not constitute the entire offshore fishing industry. EnCana agrees in principle to continuing liaison with offshore fishing industries to discuss and address issues of mutual concern as they arise. EnCana does not, however,

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

<table>
<tr><td></td><td colspan="5">feel it is necessary to establish a new committee to address this continuing liaison.
EnCana is prepared to retain fisheries observers in connection with specific activities, however it is not prepared to retain full-time fisheries observers.</td></tr>
<tr><td>Views of the NEB Member</td><td colspan="5">Regarding SPANS recommendation for an agreement, the NEB Member is of the view that six of the seven principles of an agreement have either been agreed to or fall outside the mandate of the NEB (e.g., the question of full time vs. activity specific fisheries observers is not relevant to the M&NP export pipeline, matters of compensation are outside the jurisdiction of the NEB). The principle of continuing liaison would be evaluated pursuant to the NEB's Filing Manual guidelines for consultation programs, and would be discussed in the final NEB Member's Report and Recommendations.
Regarding SPANS recommendation that all pipelines be trenched deeper than one meter and be monitored, the NEB Member is of the view that EnCana has taken an appropriate approach to minimize effects on the commercial fishing industry and would not recommend imposing this condition. The NEB Member further notes that EnCana would conduct annual surveillance of the pipeline and associated infrastructure to monitor all subsea equipment, and the results of this monitoring program would be public. To facilitate ongoing review and monitoring of pipeline cover and make such information publicly accessible, the NEB Member would recommend that the following condition (Recommendation K) be imposed:
EnCana shall file with the Board annually, unless the Board otherwise directs, a report describing exposed segments of the Offshore pipeline. The report shall, for the entire length of the pipeline, include the following information as a minimum:
a) a description of the monitoring methodology used;
b) a description of all exposed pipeline segments and free spans, including the location, length, sea bottom geology, water depth and any associated issues;
c) a description of observed coating or pipeline damage;
d) proposed changes to the pipeline monitoring program; and
e) as appropriate, proposed mitigative measures and follow-up actions with regards to proposed pipeline exposure and free spanning conditions.
The Board notes that the analysis of SPANS recommendations regarding abandonment and the M&NP option is included in sections 5.5.1 and 5.5.2 of Part I.</td></tr>
<tr><td rowspan="2">Effects Evaluation</td><td>Frequency</td><td>Duration</td><td>Reversibility</td><td>Geographical Extent</td><td>Magnitude</td></tr>
<tr><td>Low</td><td>Long Term</td><td>Reversible</td><td>Local/Area</td><td>Medium</td></tr>
<tr><td>NEB Member Recommendation</td><td colspan="5">Subject to the findings of the CSR, the NEB Member is of the view that with the implementation of the recommended condition and EnCana's proposed measures; any potential adverse environmental effects on the commercial fishing industry are not likely to be significant.</td></tr>
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8.2.7 Effects on Traditional Use by Aboriginal Persons

Background/Issues	Several reviews have indicated that the proposed Deep Panuke onshore pipeline corridor and marine landfall areas were not of high importance for traditional land use by the Mi'kmaq primarily since this site is far removed from the concentrations of Mi'kmaq population. A MEK study was recently undertaken in support of the EA for the proposed Keltic facilities and the study indicated the potential for traditional use within the Goldboro Industrial Park. EnCana has assumed that current use of lands for traditional purposes could occur in the study area for this Project.

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

Mitigation Measures	EnCana committed to be in contact with Aboriginal groups and communicate with them on relevant issues as required. EnCana would retain an Aboriginal liaison person for the Deep Panuke Project. As committed in the 2002 CSR, EnCana would include Aboriginal representatives in pipeline RoW inspections. EnCana submitted that the commitment to compensate for actual loss or damage caused by EnCana would extend to loss of hunting, fishing and gathering opportunities with respect to the Aboriginal peoples of Canada. In meetings with the Assembly and NCNS on 3 and 17 November 2006 respectively, EnCana reviewed conclusions of the EA Report (Volume 4) including the results of Mi'kmaq land use studies/professional opinions. EnCana committed to inviting Aboriginal groups to review the applicability of previous Mi'kmaq land use/professional opinions. EnCana would conduct a current and traditional use review, which included a two-phase approach: ***Phase I*** Review the applicability of the findings of the following studies/opinions pertaining to the current and traditional land use in the onshore pipeline corridor and nearshore marine landfall areas for the Deep Panuke Project: • MEK Study carried out by the Membertou Geomatics Consultants for the Keltic/Maple EA; • Aboriginal Traditional Ecological Knowledge (TEK) study carried out by the Mi'kmaq Fish and Wildlife Commission on behalf of Sable Offshore Energy Project (SOEP) for the SOEP onshore pipeline corridor and gas plant area (1999); • Expert opinion of the Membertou Corporate Division on the applicability of the SOEP TEK to the Deep Panuke onshore pipeline corridor (Appendix B, 2002 Deep Panuke Socio-Economic Impact Statement); and • Expert opinion of Dr. Stephen Davis, Davis Archaeological Consultants (Letter to EnCana dated 13 October 13 2006) on Aboriginal traditional land use in the nearshore marine pipeline landfall area. ***Phase 2*** If required, based on the review of the above studies/opinions, carry out a focused MEK study to address any gaps in knowledge of current and traditional land use in the Deep Panuke onshore pipeline corridor and nearshore pipeline landfall area.
Views of the Parties	The NCNS does not oppose development. The NCNS submitted that EnCana is a Canadian company doing their best, but it needs to balance economic development, social progress and environmental integrity. The NCNS submitted that the potential environmental and socio-economic effects on Aboriginal people have not been adequately covered. The NCNS submitted it would prefer to have EnCana work with them to develop a good working relationship for the long term. The Assembly submitted that EnCana recognized the nature of MEK and that EnCana made a commitment to work with the Assembly to complete a MEK study for this Project. The Assembly made several recommendations, including: • EnCana should seek direction from the Assembly on the completion of the MEK study. That the approval of the Proponent's Project be conditional upon the completion of a MEK, which has been approved by the Assembly. To the extent that Aboriginal groups have concerns about the potential for a project-related infringement of Aboriginal interests, the NSDOE submitted that most or all of these can be appropriately addressed through mitigation measures and other commitments and steps proposed to be taken by EnCana. For its part, NSDOE has committed to an

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

<table>
<tr><td></td><td>ongoing and constructive dialogue with Aboriginal groups beyond the regulatory proceeding related to the Deep Panuke Project.</td></tr>
<tr><td>Views of EnCana</td><td>The Goldboro area and the nearshore area where the M&NP pipeline option would come ashore are amongst the most highly studied areas in the Province of NS in terms of traditional use of the land. The results of those studies have been shared by EnCana with the Aboriginal groups and, arising out of that consultation, it was proposed that a MEK study be performed to confirm the outcome of the earlier studies and to further delineate knowledge of the area.

EnCana submitted that there has been opportunity for the NCNS and the Assembly to participate and learn more about the proposed Project. There is no evidence of significant interference with Aboriginal rights or Aboriginal treaty rights as a result of the proposed Project.</td></tr>
<tr><td>Views of the NEB Member</td><td>Should the proposed Project receive regulatory approval, the NEB Member recommends that the following condition (Recommendation D) be imposed:

EnCana shall file with the Board, 30 days prior to the commencement of construction:

a) an update on EnCana's Current and Traditional Use Review with the Assembly of NS Mi'kmaq Chiefs and the Native Council of NS, including:
i. a summary of the results of Phase 1 (i.e., a review by Aboriginal groups of the applicability of the findings of studies and opinions pertaining to the current and traditional use in the onshore pipeline corridor and nearshore marine landfall areas for the Deep Panuke Project); and
ii. if necessary, a summary of the results of Phase 2 (i.e., a focused Mi'kmaq Ecological Knowledge Study to address any gaps in knowledge of Aboriginal current and traditional use the Deep Panuke onshore pipeline corridor and nearshore pipeline landfall area).

b) an update of any outstanding issues arising from the Aboriginal consultation program, and for approval, a summary indicating how EnCana would incorporate the findings and address any issues from the current and traditional use review into the proposed Project.

With respect to the Assembly's recommendation, the NEB Member notes EnCana's willingness to accept comments on the draft scope of work for the Current and Traditional Use Review. The NEB Member is of the view that the Current and Traditional Use Review should generally be addressed early in Project planning. Furthermore the NEB Filing Manual states that applicants shall provide evidence that those Aboriginal groups who participated in the collection of traditional use information have had the opportunity to review the information and proposed mitigation. The NEB Member expects EnCana to follow the requirements outlined in the NEB Filing Manual.</td></tr>
<tr><td>Effects Evaluation</td><td><table><tr><td>Frequency</td><td>Duration</td><td>Reversibility</td><td>Geographical Extent</td><td>Magnitude</td></tr><tr><td>Low</td><td>Long Term</td><td>Reversible</td><td>Local/Area</td><td>Medium</td></tr></table></td></tr>
<tr><td>NEB Member Recommendation</td><td>Subject to the findings of the 2007 CSR, the NEB Member is of the view that with the implementation of the recommended condition and EnCana's proposed measures including completing the Current and Traditional Use Review; any potential adverse environmental effects on Aboriginal traditional use are not likely to be significant.</td></tr>
</table>

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

8.2.8 Disturbance of Legacy Munitions

Background/Issues	**Human Health Effects and Environmental Effects** Concerns were raised during the proceeding related to human health effects to workers and the public, associated with the unintentional disturbance of military dumpsites of unexploded ordnance (UXO), chemical, biological warfare agents and nuclear waste materials off the East Coast of Canada. Concerns were also raised related to potential effects on the (marine) environment and marine life.
Mitigation Measures	▪ A pipeline routing survey identified no anomalies. As the proposed Project progresses to development, subsequent surveys for the intended pipe routing and pipe lay would be conducted all the way to landfall. Visual monitoring using remotely operated vehicles (ROVs) would be conducted during installation. ▪ Preconstruction surveys would be conducted using ROVs that do not disturb the seabed. Pipeline installation activities, such as trenching, pipelaying and burial, would similarly use ROVs and not require workers to be in the vicinity of seabed disturbance. ▪ Prior to any construction or development work on the export pipeline, EnCana would contact the Department of National Defence (DND) to determine their current usage of MARLANT operation areas I and J. ▪ In addition to asking DND about any known UXO sites or MARLANT operation area usage, EnCana would specifically ask DND whether there are any known chemical or biological agents, or radioactive dump sites in that area. EnCana has committed to making this public by filing a summary of the discussion with the NEB. ▪ In the unlikely event that there is an identifiable risk of military dumpsites being encountered along the proposed Project route, based on surveys or subsequent discussions with DND, EnCana would address these matters in the EPP, Emergency Management Program, Operations and Maintenance Programs, and Construction and Safety Manuals. See Recommendations **C, F** and **G.**
Views of the Parties	M&A expressed concerns with respect to the health and safety and the environmental effects of military dump sites. These military dump sites include nuclear, chemical, biological, and UXO sites off the East Coast of Canada. M&A highlighted the uncertainties surrounding this issue, in addition to a general lack of information. There are errors in the inventories of disposal sites, and little information on how these materials disintegrate. Consequently, M&A submitted that it is important to start understanding of just what could happen (effects on human health and marine life) if some of these sites are disturbed. M&A also had concerns relating to public notification and the availability of environmental information on the issue.
Views of EnCana	EnCana submitted that the evidence indicates that the probability of encountering such materials is extremely remote. Moreover, EnCana submitted that in the event that new evidence determines an increased risk of encountering these materials, this risk would be appropriately assessed in concert with the relevant authorities and the Emergency Response Plan for the proposed Project would be modified to account for such risks. EnCana is committed to making environmental effects monitoring results publicly available and supports the archiving of environmental monitoring data in a regional database.
Views of the NEB Member	Should the proposed Project receive regulatory approval, the NEB Member recommends that the following condition (Recommendation **B**) be imposed: EnCana shall file with the Board, 30 days prior to construction, a record of consultation with the Department of National Defence - Formation Safety and Environment with

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

	respect to operational concerns and the presence of sites containing legacy munitions or unexploded ordnance, biological or chemical warfare agents and radioactive materials within the proposed Project area. The parties did not dispute the presence of military dump sites including nuclear, chemical, biological, and UXO sites off the East Coast of Canada. However, there is a concern about the likelihood of the Deep Panuke Project encountering such sites and concern over protocols for reporting should they be encountered. DND is the lead agency responsible for the identification and disposal of legacy military dump sites and the recognized authority on the subject matter.
Effects Evaluation	Frequency: Low Duration: Short term Reversibility: Irreversible Geographical Extent: Local/Area Magnitude: Medium
NEB Member Recommendation	Subject to the findings of the 2007 CSR, the NEB Member is of the view that with the implementation of the recommended condition and EnCana's proposed measures, including consultation with DND and relevant authorities; any potential adverse environmental effects associated with the disturbance of legacy munitions and other related materials are not likely to be significant.

8.3 Cumulative Effects Assessment

The assessment of cumulative effects considers how adverse environmental effects, arising from a proposed Project after mitigation, interact with effects from other projects whether past, present or future. In this case the M&NP export pipeline option is the proposed Project.

Other projects, facilities or activities located near the proposed M&NP export pipeline option and whose environmental effects could potentially interact cumulatively with those from the pipeline option include:

- the facilities and activities of the proposed Project under CNSOPB jurisdiction;
- other projects in the Guysborough Industrial Park, including the proposed Keltic petrochemical and Maple LNG facilities; and
- the existing SOEP pipeline.

The residual effects from these projects include air emissions and, permanent conversion of portions of natural terrestrial and marine environment to constructed environment.

A primary residual effect that would result from the proposed M&NP export pipeline option after the application of mitigation measures is the long-term alteration of land and natural environment (or seabed bottom). Onshore this will be manifested by a pipeline RoW and offshore this will be manifested by the presence of buried or exposed portions of the pipeline.

While the onshore loss or conversion of land from its current state is cumulative, the NEB Member notes that the proposed Project area and adjacent land uses are zoned for an industrial park, indicating that this conversion of land use is acceptable.

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

With respect to the M&NP export pipeline option and the potential for the presence of two pipelines on the seafloor, the NEB Member notes that the implementation of mitigation measures and the compliance with recommended conditions would minimize any lasting adverse effects.

Air emissions from the proposed Project is another potential adverse environmental effect that could interact cumulatively with the other identified nearby projects and activities During the hearing, SCC expressed concern that the relatively large emissions from the Deep Panuke development as a whole "clearly would have an impact on not only NS but Canada's global emissions of greenhouse gases". SCC also submitted that EnCana should have addressed air emissions resulting from the end use of the gas. The NEB Member finds that air emissions from the construction and operation of the M&NP export pipeline option would be a relatively minor contribution, both to NS and Canadian total air emissions when compared with those resulting from the exploitation of the gas resource itself. The NEB Member notes that natural gas is the cleanest burning fossil fuel and also recognizes the merits of EnCana's claim that natural gas produced from the proposed Project could replace higher carbon content fuels.

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

9.0 NEB MEMBER RECOMMENDATIONS

It is recommended that in any Certificate that the NEB may grant, a condition be included requiring the applicant to carry out all of the environmental protection and mitigation measures outlined in its application and subsequent submissions.

Further, other recommendations include:

Prior to Construction

A. EnCana shall file with the Board, at least 14 days prior to construction, a detailed breeding bird and nest survey. The survey shall include:
  a) a special attention directed at locating:
    i. SARA listed species (such as the Short-eared Owl);
    ii. species currently considered for inclusion to the SARA list (such as the Rusty Blackbirds); and
    iii. migratory birds (such as the Greater Yellowlegs).
  b) evidence to confirm that relevant regulatory authorities had an opportunity to review and comment on the proposed methods for the survey;
  c) the results of the survey; and
  d) if applicable, evidence of consultation with relevant regulatory authorities, such as Nova Scotia Department of Natural Resources (NSDNR) and Environment Canada, regarding satisfaction with the proposed mitigation measures.

B. EnCana shall file with the Board, 30 days prior to construction, a record of consultation with the Department of National Defence - Formation Safety and Environment[28] with respect to operational concerns and the presence of sites containing legacy munitions or unexploded ordnance, biological or chemical warfare agents and radioactive materials within the Project area.

C. EnCana shall file with the Board for approval, at least 30 days prior to construction, a final and updated project-specific Environmental Effects Monitoring Plan (EEMP) and Compliance Monitoring Plan for the NEB regulated pipeline.

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[28] Department of National Defence - Formation Safety and Environment or any successor or agency performing substantially similar functions with respect to legacy munitions or unexploded ordnance, biological and chemical warfare agents and marine radioactive dumpsites.

D. EnCana shall file with the Board, 30 days prior to the commencement of construction:

- a) an update on EnCana's Current and Traditional Use Review with the Assembly of Nova Scotia Mi'kmaq Chiefs and the Native Council of Nova Scotia, including:
  - i. a summary of the results of Phase 1 (i.e., a review by Aboriginal groups of the applicability of the findings of studies and opinions pertaining to the current and traditional use in the onshore pipeline corridor and nearshore marine landfall areas for the Deep Panuke Project); and
  - ii. if necessary, a summary of the results of Phase 2 (i.e., a focused Mi'kmaq Ecological Knowledge Study to address any gaps in knowledge of Aboriginal current and traditional use the Deep Panuke onshore pipeline corridor and nearshore pipeline landfall area).
- b) an update of any outstanding issues arising from the Aboriginal consultation program, and for approval, a summary indicating how EnCana will incorporate the findings and address any issues from the current and traditional use review into the Project.

E. EnCana shall file with the Board, at least 45 days prior to construction, the detailed onshore route selected by EnCana. The detailed onshore route shall describe the following elements:

- a) alternative routes considered and the reasoning for the onshore route selected;
- b) measures and actions taken by EnCana to avoid any sensitive features (e.g. for breeding birds or species of conservation concern), sensitive habitats and identified areas containing contaminated soils when finalizing the selection of the onshore route; and
- c) presence and nature of sensitive features, such as watercourses and wetlands, sensitive habitats, as well as identified areas containing contaminated soils within the disturbance footprint of the Onshore Project.

EnCana shall not deviate from the selected route without prior approval from the Board.

F. EnCana shall file with the Board for approval, at least 45 days prior to the Offshore construction, an updated, project-specific Environmental Protection Plan (EPP) for the offshore pipeline. This EPP shall provide an elaboration of all commitments and a comprehensive compilation of all environmental protection procedures and mitigation measures, as developed and as set out in EnCana's applications for the NEB regulated offshore pipeline, and subsequent filings. The EPP shall describe the criteria for the implementation of all procedures and measures, and shall use clear and unambiguous language that confirms EnCana's intention to implement all of its commitments. Offshore construction shall not commence until EnCana has received approval of its EPP from the Board. The project-specific EPP shall address, but is not limited to, the following elements:

- a) environmental procedures including site-specific plans (such as EnCana's Code of Practices for Sable Island, The Gully Marine Protected Area and Country Island), criteria for implementation of these procedures, mitigation measures applicable to all offshore project phases, and activities; and;
- b) evidence of consultation with relevant regulatory authorities that confirms their satisfaction with the proposed mitigation.

G. EnCana shall file with the Board for approval, at least 45 days prior to the Onshore construction, an updated, project-specific Environmental Protection Plan (EPP) for the Onshore pipeline. This EPP shall provide an elaboration of all commitments and a comprehensive compilation of all environmental protection procedures, mitigation measures, as developed and as set out in EnCana's applications for the NEB regulated Onshore pipeline, and subsequent filings. The EPP shall describe the criteria for the implementation of all procedures and measures, and shall use clear and unambiguous language that confirms EnCana's intention to implement all of its commitments. Onshore construction shall not commence until EnCana has received approval of its EPP from the Board. The project-specific EPP shall address, but is not limited to, the following elements:

- a) environmental procedures, criteria for implementation of these procedures, mitigation measures applicable to all Onshore project phases, and activities;
- b) a reclamation plan which includes a description of the condition to which the applicant intends to reclaim and maintain the right-of-way once the construction has been completed, and a description of measurable goals for reclamation; and
- c) evidence of consultation with relevant regulatory authorities that confirms their satisfaction with the proposed mitigation.

H. If watercourses or wetlands are present within the selected onshore route, EnCana shall file with the Board for approval, at least 45 days prior to construction, an assessment which provides EnCana's wetland and watercourse crossing method and rationale for the decision. The assessment to support the preferred and applied for crossing method shall include, but is not limited to, the following elements:

- a) a detailed description of the wetlands and watercourses to be crossed; and
- b) a comparative review of the different potential wetland and watercourse crossing methods, including Horizontal Directional Drilling (HDD), comprising information on:
    - i. technical feasibility;
    - ii. potential environmental effects, including lost of ecological functions; and
    - iii. estimated relative costs.

I. EnCana shall file with the Board for approval, at least 45 days prior to construction, an HDD landfall feasibility assessment, which provides EnCana's landfall pipeline proposed installation method and rationale for the decision. This assessment shall include the following elements as a minimum:

- a) a comparative review of the different potential landfall pipeline installation methods;
- b) geotechnical and construction feasibility assessments performed by persons with subject expertise to support the preferred and applied-for landfall pipeline installation method;
- c) reports on environmental impacts studies as completed;
- d) reports on geotechnical studies as completed; and
- e) a hazard analysis and contingency measures completed for the selected installation method.

During Construction

J. If contamination or acidic drainage is encountered during the Geotechnical Testing Program along the easement:

   a. EnCana shall file with the Board, at least 14 days prior to the commencement of the remediation:

      i. detailed description of the extent and nature of the contamination or acidic drainage encountered;

      ii. a detailed site assessment;

      iii. a remediation plan; and

      iv. evidence of consultation with relevant regulatory authorities that confirms satisfaction of the proposed remediation plan and associated mitigation.

   b. EnCana shall commence remediation within a year of encountering contamination.

Post Construction

K. EnCana shall file with the Board annually, unless the Board otherwise directs, a report describing exposed segments of the Offshore pipeline. The report shall, for the entire length of the pipeline, include the following information as a minimum:

   a) a description of the monitoring methodology used;

   b) a description of all exposed pipeline segments and free spans, including the location, length, sea bottom geology, water depth and any associated issues;

   c) a description of observed coating or pipeline damage;

   d) proposed changes to the pipeline monitoring program; and

   e) as appropriate, proposed mitigative measures and follow-up actions with regards to proposed pipeline exposure and free spanning conditions.

10.0 CONTACT

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PART III: COMMISSIONER ENVIRONMENTAL REVIEW

11.0 COMMISSIONER ROLE

The Commissioner's role is to conduct a public review of the potential environmental and socio-economic aspects of the Project, including the environmental factors described in the CEA Act Scope of the Environmental Assessment for the Project.

The Commissioner has reviewed all the evidence and is satisfied that the Environmental Assessment Report (EAR) prepared by EnCana is consistent with the Scope of the Environmental Assessment. The various Intervenors, Government Participants and Interested Parties raised a number of environmental and socio-economic concerns through the Information Requests, Written Evidence, Letters of Comment, Oral Statements and active participation at the hearing.

In this Part III of the JER, the Commissioner has summarized the comments, evidence and submissions received during the public review in table form as Issues and Concerns and Recommended Action Proposed by Comment Providers (section 12.0).

The Commissioner has examined the major issues and considered the response from EnCana. The Commissioner has made comments (section 13.0) and recommendations (section 14.0) with respect to the issues.

The Commissioner is also required to prepare and submit a Report to the CNSOPB respecting the Development Application. Some of the issues which have been raised have implications for both the JER and the Report to the CNSOPB. The Commissioner has determined that it is more appropriate to fully discuss certain matters in the Report to the CNSOPB, rather than deal with them in the JER. These matters include SPANS' request that the CNSOPB make the Fisheries Observer Program a condition of Development Plan approval; and Aboriginal consultation.

12.0 SUMMARY OF COMMENT PROVIDERS' ISSUES AND CONCERNS AND RECOMMENDED ACTION

Comments Providers	Issues and Concerns	Recommended Action Proposed by Comment Providers
CPAWS-NS WWF-ARO SCC	• Concerns were expressed about the potential impact of the proposed Project on: • The eastern Scotian Shelf ecological and biological communities in general and on designated and candidate sensitive communities in particular • The ESSIM Initiative • The identification of EBSAs • Priority Area # 24 which may qualify as an EBSA under ESSIM • Marine Protected areas - Gully MPA	• Project should not proceed before a comprehensive assessment of conservation needs and the implementation of necessary management measures to protect offshore ecosystems which can be accomplished by ESSIM • EnCana should engage in ESSIM more directly • EnCana should develop a rigorous program to monitor the fate and effects of noise and waste discharges on the marine ecosystem in order to identify potential significant impacts • EnCana must be open and transparent on monitoring results and impact of the proposed Project • EnCana must be proactive and employ an ecosystem approach and the precautionary principle
CPAWS-NS WWF-ARO	• Concerns were expressed about the direct and indirect impact on Sable Island ecosystems from: • Oil spills • Damage to marine life in the larval retention zone from waste discharges and noise	• EnCana should prepare a Spill Response Plan • Project should not proceed prior to implementation of ESSIM • EnCana should expand the scope of the environmental assessment of Sable Island impacts to include effects arising directly from alterations to the surrounding marine ecosystem • Rigorous environmental monitoring • Precautionary approach
CPAWS-NS	• Concern expressed that EnCana did not adequately assess the potential impacts of the proposed Project on the Haddock Box	• Conduct detailed analysis of potential impact
CPAWS-NS NCNS SCC	• Concern about impact on Winter Skate which is a Species of Special Status pending public consultation for addition to the SARA listed species; in particular because its spawning habits are not well known	• Research and/or monitoring program
SCC CPAWS-NS	• Concern that noise from the proposed Project, especially when combined with the noise emanating from other anthropogenic activities, will adversely affect the behaviour of cetaceans, particularly their ability to communicate; special concern for the endangered bottlenose whale	• Use best practices and international codes of conduct • Monitor 500 m radius exclusion zone for 30 min. prior to start of pile driving, suspend if marine mammal enters • Consider conducting drilling from man-made islands • Consider using hovercraft as supply vessels where feasible

Comments Providers	Issues and Concerns	Recommended Action Proposed by Comment Providers
		• Reduce or avoid noise input during spawning seasons or other sensitive time periods for marine life • Consider deploying bottom-mounted receivers to monitor noise levels. List full acoustical information for noise sources used • Need 100% observer coverage
CPAWS-NS SCC	• Concern that toxic substances in drilling muds will be distributed over a wide area and have an adverse effect on demersal fish • Concern that mercury in discharged drilling muds may contaminate sediment and marine life as well as humans who consume fish products	• Monitoring and avoidance measures where appropriate • Baseline study to assess existing mercury contamination before approval given • Zero discharge of drilling muds in the marine environment • Bring drilling mud and cuttings ashore
CPAWS-NS SCC	• Concern that toxic elements in produced water may have an impact on the reproductive success and growth of fish and invertebrates	• Monitor potential impacts and make Project modifications • Closer analysis, vigilant monitoring of dispersal patterns and impacts
CPAWS-NS	• Concern about the practice of discharging wastes into the environment	• Adopt Norwegian zero discharge goal for offshore oil and gas industry
SPANS	• Concern about the impact on fisheries and fish stocks under moratorium	• Need an agreement with EnCana - Fisheries Observer Program • Require all pipelines, flowlines & umbilicals to be trenched at a minimum depth deeper than 1 m., be monitored regularly and be maintained
SCC SPANS	• Concern that adoption of the M&NP option in preference to the SOEP option would result in unnecessary environmental and socio-economic impacts	• SOEP subsea option has less environmental impacts • SOEP subsea option would result in less pipeline to remove at decommissioning • SPANS - Deny EnCana's request for the M&NP export pipeline option
CPAWS-NS Guysborough County Regional Development Authority	• Concern about the impacts of drilling, laying pipes and flowlines on 2 different benthic seascape types • Concern about impacts on benthic organisms which serve as the main food source for some commercial fish species	• Re-evaluate • Use horizontal directional drilling to install pipeline & require use of DP vessels to install remaining portion of pipeline • Minimize pipeline footprint and spacing - limit pipeline separation distance in near shore • Utilize best practices during construction and operation
SPANS SCC	• Concern about the abandonment of pipelines, flowlines and umbilicals and its impact on fishing	• Do not approve in advance • Require EnCana to remove all subsea equipment on or in the seafloor during decommissioning
CPAWS-NS	• Concern about the impact of increased use of the SOEP pipeline	• Consider impacts due to increased use of SOEP pipeline

13.0 COMMISSIONER ANALYSIS

EnCana has assessed the impact of its Project on those components of the biophysical and socio-economic environments subject to potential impacts. It concluded, as was concluded in the approved 2002 CSR, that the proposed Project would not likely have any significant effect on them and provided evidence to support this conclusion. The only predicted significant effect identified by EnCana was associated with a well blowout or rupture of piping leading to the release of large amount of acid gas which would have health and safety implications for platform workers and passengers on vessels downwind. To mitigate this potentiality, EnCana stated that it will incorporate preventative design measures into its Project in efforts to ensure that the occurrence of such an event is "extremely unlikely" and will establish emergency response procedures to further reduce the likelihood of serious effects.

Parties to the review expressed a number of concerns and raised a number of issues associated with EnCana's environmental and socio-economic assessment. These are reviewed in the following sections.

13.1 ESSIM

Several Comment Providers expressed concern that EnCana's Project would foreclose integrated planning opportunities under the auspices of the ESSIM Initiative. ESSIM is a collaborative ocean management and planning process being led and facilitated by DFO under Canada's Oceans Act. The primary aim of the Initiative is to develop and implement an Integrated Ocean Management Plan for this large marine region. This multi-year, strategic level plan will provide long-term direction and a common basis for integrated, ecosystem-based and adaptive ocean management. One aspect is the identification of EBSAs and the protection of sensitive marine environments such as those contained within the Gully. The WWF-ARO submitted that the proposed Project overlaps Priority Area #24 which has been identified as an area that may qualify as an EBSA.

DFO was a Government Participant in this hearing. It did not raise any concern about the proposed Project proceeding before ESSIM had completed its work.

EnCana submits that, although Priority Area # 24 does overlap one existing well, it has demonstrated in its environmental assessment that its Project will have no environmental effects and will not interfere unduly with any other marine uses or foreseeable uses including shipping, submarine cables, military activities and other oil and gas initiatives. It therefore concludes that its proposal does not represent an obstacle to developing planning options for this region. Further, it argues that its commitment to active involvement in the ESSIM process will help ensure that its Project activities will continue to take place within the context of an integrated ocean management framework for this region.

EnCana submits that its proposed Project will not have any significant effect on the Gully MPA because: it is located over 100 km from it which is 75 km further from this protected area than the current platforms associated with the SOEP pipeline; noise from the proposed Project is unlikely to be detectable by marine animals in the Gully; and EnCana's Code of Practice includes a commitment to avoid conducting activities inside the protected area and operating aircraft below 500 m over it.

The Commissioner determines that the evidence does not support a finding that the proposed Project not be approved until ESSIM is completed.

The Commissioner recommends that EnCana continue active participation in ESSIM.

13.2 Monitoring

Many Comment Providers recommended programs to monitor the fate and effects of specific discharges, to monitor the effects of a broader range of Project activities on specific environmental components and "to test air and water quality levels and dispersal patterns of Project emissions, as well as bio/ecological effects" to serve as an 'early warning system' (CPAWS-NS). They also recommended that the results of these programs be made available to the public. CPAWS-NS expressed the view that the monitoring program would have a greater degree of credibility if it were conducted independently or if stakeholders with marine resource interests were involved in the monitoring process.

EnCana provided an Anticipated Table of Contents for a proposed EEMP. In addition, EnCana committed to developing an environmental monitoring program that will describe "actions for quantifying damage to the environment" as part of its Spill Response Plan. It noted that the results of the monitoring program will be made public. EnCana has made provisions for stakeholder consultation, including consultation on environmental effects monitoring in its EHS (Environment, Health and Safety) management system. EnCana stated that the EEMP together with regular visits re compliance monitoring from regulators will ensure an effective monitoring program.

SPANS is seeking to incorporate a Fisheries Observer Program to monitor those activities of EnCana which may affect the fishery as part of a bilateral agreement respecting compensation for the fisheries industry. SPANS is requesting that this be made a condition of CNSOPB approval of the Development Plan. This issue will be dealt with in the Commissioner's Report to the CNSOPB.

The Commissioner is satisfied that EnCana will be required to produce an EEMP before regulatory approval is given and that the results of the monitoring will be made public.

The Commissioner recommends that EnCana make the results of its monitoring available to the public on a timely basis and that the presentation of these results pay particular attention to the effects on marine life in the vicinity of the proposed Project and the direct and indirect effects of the proposed Project on the resources of Sable Island.

The Commissioner recommends that approval of the proposed Project be contingent upon effective consultation.

13.3 Sable Island

CPAWS-NS and WWF-ARO raised concerns about potentially adverse impacts on Sable Island and its associated resources from oil spills and development and production activities. CPAWS-NS noted that Sable Island provides a "critical habitat for the endangered Roseate Tern" and recommended that EnCana include this species in its monitoring program and in its plans for responding to "accidents and malfunctions".

CPAWS-NS expressed concern that EnCana did not provide "enough information . . . on the possible sub-lethal or environmental effects" of SO_2 from flaring or an accidental event nor did it indicate what it meant by 'non-significant' effects associated with such releases.

CPAWS-NS expressed the view that, in addition to EnCana providing an opportunity for stakeholder consultation in its monitoring program, EnCana should also consult with stakeholders during the preparation of the EPP for Sable Island.

EnCana's evidence is that it is unlikely that chronic or acute effects will occur to the plants and wildlife of Sable Island, given the distance and location of the Island from the proposed Project. It provided additional information during the public review about the fate and effects of SO_2 from flaring or accidental releases to support its conclusion that under the worst case scenario involving an accident or malfunction, the maximum ground level concentrations for SO_2 and H_2S would be below "effects criteria used by national and international agencies for protecting the environment." It has updated its Code of Practice for Sable Island to reflect the recent change in management on the island and has committed to "provide information to the public and interested stakeholders about the proposed Project in a timely fashion".

The Commissioner concludes that the project will not have any significant effect on the resources of Sable Island.

The Commissioner recommends that EnCana include measures in its EPP and Spill Response Plan to protect the Roseate Tern from possible impacts of development and production activities.

13.4 Haddock Box

CPAWS-NS raised concern that the area designated as the Haddock Box, which is west of the proposed Project site, could be adversely affected from the accidental release of harmful substances and recommended the completion of a more detailed analysis.

EnCana submits that potential interactions between the proposed Project and the Haddock Box are very limited. EnCana argues that the Haddock Box was not part of the scope of the 2002 approved CSR, is not a new feature and was not included in the scope of the Environmental Assessment for Deep Panuke, and it was not raised as an issue in the 2006 consultation program conducted for the preparation of EnCana's EA Report.

Spill modelling suggests that travel distances for dispersed oil clouds are unlikely to reach the Haddock Box. Further, EnCana argues that it has assessed the impact of spills on marine fish including egg, larval and juvenile stages and therefore a specific assessment of the impact of oil spills on the Haddock Box is not necessary.

The Commissioner is satisfied that there is little likelihood of potential interactions between the proposed Project and the Haddock Box.

13.5 Winter Skate

Winter Skate is a Species of Special Status pending public consultation for addition to the SARA listed species. CPAWS-NS requested that a research and/or monitoring program be developed to promote its protection from the proposed Project effects. Mr. Hunka, on behalf of the Native Council of NS, was concerned that EnCana was inconsistent in its response to questions about the Winter Skate.

During questioning by the SCC, Stephen Fudge on behalf of EnCana, made the following comments about Winter Skate: "given the very small footprint of this facility, the characterization of the discharges and emissions from the proposed Project, we do not predict any significant impact on this species nor any other fish species on this portion of the Sable Bank. ... given that it's found throughout the Gulf of St. Lawrence, from Newfoundland to Cape Hatteras, and given the size of the footprint of this offshore facility, and the fact that all the discharges and emissions will meet or exceed all regulatory requirements, and that there'll be no impact on fish that may be in the vicinity of this facility, no, I'm not concerned about the impacts on the Winter Skate and they will not be significant."

EnCana confirmed that its proposed Effects Monitoring Program would "... include verification of the absence of species of 'special concern' ..." such as the Winter Skate.

The Commissioner is satisfied that the EEMP will meet the requested monitoring requirements.

13.6 Noise Impacts on Cetaceans

The SCC submitted a paper entitled *Potential Underwater Noise Impacts on Cetaceans from the Deep Panuke Offshore Gas Development Project* by Linda S. Weilgart, Ph.D. The SCC evidence noted that acoustic pollution is "of special concern for cetaceans as they depend on sound as their primary sense and are highly vocal". It stated that acoustic pollution affects most aspects of cetacean's lives including reproduction, feeding, communication, hazard avoidance and navigation and that these effects can be experienced over a large area. The SCC identified a number of Project activities such as pile driving, blasting, drilling, production and vessel traffic that it felt could adversely affect cetaceans although it noted that the precise effects are not known at this time. It concluded with several recommendations for mitigating potential adverse effects including: construction of an island as a platform for drilling; use of international codes of conduct for the mitigation of underwater noise, especially from pile-driving and blasting; monitoring for the presence of cetaceans in a 500 m zone around pile-driving activities; and use of hovercraft for supply vessels.

CPAWS-NS also expressed concern about the potential impact on cetaceans of undersea noise arising from the proposed Project. It expressed particular concern that noise from this Project, when combined with existing noise from other anthropogenic activities in the vicinity, could adversely affect the endangered northern bottlenose whale.

EnCana submitted a detailed response to Ms. Weilgart's paper. EnCana's position is that jack-up rigs are quiet and have a minimal effect on marine mammals and that there would be considerable noise to construct a man-made island. EnCana states that there will be no underwater blasting and the amount of pile-driving is substantially less than for the earlier Project. EnCana provided evidence refuting the accuracy of the Ms. Weilgart's evidence supporting the request to establish a 500 m monitoring zone around pile-driving activity as well as the suggestion that noise should be reduced or avoided in spawning season. EnCana rejects the use of hovercraft as supply vessels because they cannot operate in high seas. EnCana agrees that measuring the source levels of some of the components might be useful and will consult with CNSOPB and other key regulators about specific noise monitoring measures.

The Commissioner is satisfied with EnCana's response to this issue.

13.7 Mercury

The SCC filed written evidence by Daniel Green on the environmental impacts of mercury contamination from drilling mud releases. Mr. Green referenced tables from a paper, which EnCana then submitted: *Mercury in Drilling Discharges - An Overview* by Michael E. Parker. Mr. Parker's paper concludes that studies have shown that the mercury in drilling discharges poses no significant threat to the environment, human health, food safety, or water quality.

EnCana provided a table showing that the levels of mercury measured in sediments at drilling and production sites off the East Coast have "... consistently been very low." Further, EnCana plans to use only salt based drilling muds in its four re-entry wells and only small amounts, if any, of barite to drill the remaining wells. Where high density muds are required, EnCana has committed to selecting barite which "... has the lowest mercury content available, depending on mud supply availability." EnCana provided evidence to support the proposition that there is no known connection between mercury in drilling muds and the bioavailability of mercury in the marine environment.

In the Commissioner's opinion, the evidence presented does not indicate that mercury contamination of fish will result from the proposed Project.

13.8 Produced Water

Under EnCana's current proposal, the amount of water produced during production will increase from a maximum of 7,000 – 10,000 bpd to a maximum of 40,000 bpd. CPAWS-NS, the SCC and SPANS have raised a number of concerns including the adequacy of quality control measures to verify that the oil content in produced water meets regulated requirements and the need for monitoring the fate and effects of produced water discharged in the marine environment.

Mr. Skrypnek for EnCana explained that the change in projections is a result of new information acquired from the results of recent drilling activity. Two new wells have encountered a water aquifer. Mr. Skrypnek stated: "So what that means to us is we're very confident that there is an aquifer connected to the gas zone at Deep Panuke and that it can be produced. He went on to state "that the majority of our gas reserves in Deep Panuke come from what we call a fractured reservoir and what the fractures can do is provide channels that the aquifer -- that the water from the aquifer can make its way into the gas zone."

EnCana stated that the method for verifying the oil content in produced water prior to discharge has not been selected but the analysis will either be made in a lab on the platform or by an instrument designed to analyze oil in the produced water stream.

EnCana stated that it will cooperate with the Centre for Offshore Oil and Gas Environmental Research (COOGER) on investigating fate and effects of produced water discharges from the MOPU.

13.9 Discharges Policy

CPAWS-NS recommended that the Norwegian zero discharge goal be adopted. Both CPAWS-NS and the SCC recommended that drilling muds be taken ashore and not disposed at sea.

While the Norwegian zero discharge goal is a goal that one might aim for, the evidence does not indicate that there will be any significant environmental effects arising from routine drilling and production activities. In addition, EnCana has committed to preparing a Spill Response Plan, EEMP, an EPP and an Emergency Management Plan. By complying with these plans, EnCana should reduce the potential for significant or irreversible damage to the environment arising from routine or accidental events.

13.10 Impact on Fisheries

SPANS expressed concern that pipelines, flowlines and umbilicals could interfere with fishing activities, particularly if not protected by the safety zone or, alternatively, in the future when the Deep Panuke Project was abandoned. It recommended that all such lines be trenched to a minimum depth deeper than one meter where technology permitted and that this depth be maintained through the duration of the proposed Project.

EnCana stated it expects to bury all in-field flowlines and umbilicals to a minimum depth of one meter and anticipates that natural processes will bury these lines to a greater depth by the end of the project. It plans to bury the export pipeline in areas where "mobile fishing gear is historically most used." The export pipeline will be designed to withstand impacts of conventional gear on unburied segments. The location of the project infrastructure will be recorded on hydrographic charts. Compensation for any residual effects such as loss of fishing gear or other damage will be addressed under the CNSOPB *Compensation Guidelines Respecting Damages Relating to Offshore Petroleum Activity*. In addition, EnCana stated that it would indemnify the fishery for any loss associated with consequential damages during normal fishing activities.

SPANS also expressed concern that EnCana was not prepared to compensate the fishery for actual loss to the "resource upon which we depend".

EnCana stated it would agree to such "compensation [and] indemnification . . . but . . . would like to see this as a condition of approval." It would be prepared to compensate the fishery from "operational impacts beyond the 500 metre radius safety zone even if such loss is the result of activities permitted under the law or by regulations".

EnCana modified some its commitments from the 2002 CSR, including the decision not to develop a compensation program in consultation with fishing interests but instead to adopt the CNSOPB *Compensation Guidelines Respecting Damages Related to Offshore Petroleum Activity.*

SPANS objected to this change and requested that an agreement between the offshore fisheries industry and EnCana be a condition attached to the CNSOPB's approval of the Development Plan. SPANS outlined Seven Principles which would form the basis of the agreement.

During cross-examination of the EnCana witness panel by SPANS, David Kopperson, EnCana VP Atlantic Canada, agreed to all of the Principles with the exception of Principle #3, the Fisheries Observer Program.

The Commissioner understands that EnCana did not agree to enter into a bilateral agreement with SPANS and others engaged in the offshore fisheries.

The Commissioner has indicated above that the matter of the Fisheries Observer Program will be dealt with in the Commissioner's Report to the CNSOPB.

The Commissioner recommends that EnCana's compensation commitments be made a condition of the approval of the proposed Project.

13.11 Impact of Removing Natural Gas from the Ecosystem

CPAWS-NS noted that there was no mention in the EAR of the value of natural gas as a component of the ecosystem or the potential impacts of removing it from the ecosystem. CPAWS-NS went on to state that many areas of the Scotian Shelf remain understudied. CPAWS-NS requested that there be a discussion of the possibility of gas seep-associated communities on the Scotian Shelf region.

EnCana did not respond to this issue.

The Commissioner is not satisfied that there is a sufficient basis to direct that EnCana engage in studies of this nature.

13.12 Greenhouse Gases

The SCC recommended that in addition to assessing the greenhouse gases that will be generated by a Project, a proponent should be required to complete an assessment of the greenhouse gas emissions that will potentially be released by the end-users of the product produced by the proposed Project. The SCC requested that EnCana be required to complete such an assessment.

The NS Department of Energy noted that the Province recognizes that the use of natural gas from the proposed Project will result in greenhouse gas emissions. Since natural gas is a lower carbon fuel source, however, its use will result in a reduction of greenhouse gas emissions to the extent that it is used to replace higher carbon content fossil fuel.

It is expected that EnCana will demonstrate responsible corporate conduct and will ensure that relevant and up-to-date standard design and mitigation measures are put in place and enforced to minimize, up to a reasonable and practical extent, the air emissions footprint of the proposed Project. In the Commissioner's opinion, in light of recent scientific information regarding climate change developments, there is merit in the SCC's recommendation. The issue of requiring a proponent to include an assessment of the potential impact of greenhouse gas emissions by end-users of the product should be studied.

The Commissioner recommends that the CNSOPB give consideration to conducting a study of the issue of requiring a proponent to include an assessment of the potential impact of greenhouse gas emissions by end-users of the product.

13.13 Legacy Munitions/Unexploded Ordnance/Biological or Chemical Warfare Agents and Radioactive Materials

M&A expressed concern that the proposed Project may disturb military dumpsites containing chemical, biological or nuclear materials. It argued that such disturbances pose a threat to human health and marine life. Further, it argued that there is no known accurate information on the location of these materials nor their present state of deterioration. He recommended that Mr. Kyle Penney, Staff Officer at DND, who he identified as an expert on the distribution and nature of marine dumpsites, be contacted for information regarding the possible presence of military dumpsites in the vicinity of the proposed Project. EnCana testified that it contacted Mr. Penney regarding the presence of unexploded ordnances and was informed that there were none. M&A argued that EnCana's request to Mr. Penney was incomplete and therefore questions of health and safety have not been fully addressed.

In order to verify the presence or absence of military dumpsites, M&A recommends that scientific studies be conducted prior to initiating work on the proposed Project.

In addition to reviewing the potential for the existence of discarded hazardous military materials with Mr. Penney, EnCana also offered the following: no evidence of such materials at the Cohasset-Panuke Project site which was subject to "repeated scanning and side-scanning"; the pipeline routing survey found no anomalies that might suggest the existence of such materials; for most of its length, the proposed M&NP pipeline option parallels the SOEP pipeline where no materials of this nature have been identified; and an additional survey will be conducted on the proposed pipeline route prior to installing the pipeline. Further, EnCana has confirmed that it will consult with DND prior to pipeline construction. If risks are identified, they will be addressed in EnCana's emergency response plans.

The Commissioner recommends that EnCana consult fully with the Department of National Defence with respect to the possible presence of legacy munitions or unexploded ordnance, biological or chemical warfare agents and radioactive materials within the proposed Project Area.

13.14 Aboriginal Issues

The Native Council of NS played an active role in the hearing. The Confederacy of Mainland Mi'kmaq and the Union of NS Indians submitted written final argument. While there are differences in their recommendations, the three organizations have similar environmental concerns.

EnCana is working with the three organizations on the creation of an Aboriginal Liaison position and the MEK Study. EnCana needs to continue an effective communication with the Aboriginal community.

The Commissioner will address the issue of Aboriginal Consultation in the Commissioner's Report to the CNSOPB.

The Commissioner recommends that EnCana continue to work with the Aboriginal organizations to develop the Aboriginal Liaison position and complete the MEK Study.

14.0 COMMISSIONER RECOMMENDATIONS

1. The Commissioner recommends that EnCana continue active participation in ESSIM.
2. The Commissioner recommends that EnCana make the results of its monitoring available to the public on a timely basis and that the presentation of these results pay particular attention to the effects on marine life in the vicinity of the proposed Project and the direct and indirect effects of the proposed Project on the resources of Sable Island.
3. The Commissioner recommends that approval of the proposed Project be contingent upon effective consultation.
4. The Commissioner recommends that EnCana include measures in its EPP and Spill Response Plan to protect the Roseate Tern from possible impacts of development and production activities.
5. The Commissioner recommends that EnCana's compensation commitments be made a condition of the approval of the proposed Project.
6. The Commissioner recommends that the CNSOPB give consideration to conducting a study of the issue of requiring a proponent to include an assessment of the potential impact of greenhouse gas emissions by end-users of the product.
7. The Commissioner recommends that EnCana consult fully with the Department of National Defence with respect to the possible presence of legacy munitions or unexploded ordnance, biological or chemical warfare agents and radioactive materials within the proposed Project Area.
8. The Commissioner recommends that EnCana continue to work with the Aboriginal organizations to develop the Aboriginal Liaison position and complete the Mi'kmaq Ecological Knowledge (MEK) Study.

15.0 CONTACT

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PART IV: SIGNATURE PAGE

Linda D. Garber

Linda D. Garber
Commissioner appointed by the Canada-Nova Scotia Offshore Petroleum Board

Halifax, Nova Scotia
11 April 2007

Kenneth M. Bateman
National Energy Board Member appointed pursuant to section 15 of the NEB Act

Calgary, Alberta
11 April 2007

PART V: APPENDICES

APPENDIX 1: SUMMARY OF COMMITMENTS FROM THE 2002 CSR [29]

Onshore Pipeline Routing and Construction, and Right-of-Way Management
▪ The onshore pipeline route will avoid environmentally sensitive areas such as wetlands and will not cross Betty's Cove Brook
▪ EnCana will consult with the Municipality of the District of Guysborough in determining the location of the onshore facilities as well as the onshore pipeline route
▪ The working width for construction activities, a combination of the 25 m wide permanent right-of-way (RoW) and a 25 m wide temporary work room (TWR), will be acquired in consultation with the affected landowners. The TWR will be increased to 75 m wide at landfall for a total of 100 m working width
▪ The Onshore Construction EPP will generally address environmental constraints on the pipeline route and expected mitigation. The EPP will be included in the Request for Quote for the onshore pipeline installation package and will include the following: ▪ Erosion and sediment control measures to prevent sediment-laden runoff and potential acidic run-off from reaching streams and/or marine waters. NSDEL erosion and sediment control measures will be referenced. The plan will incorporate a monitoring program where warranted ▪ Mitigation of acid rock drainage in the event that sulphide-bearing bedrock is encountered. A geotechnical study will be conducted to identify potential acidic bedrock areas, providing the basis for mitigation. M&NP's Acid Rock Drainage Construction Response Plan and Guidelines for Development on Slates in Nova Scotia (NSDOE and Environment Canada 1991) will be consulted as well as applicable regulations. EnCana will minimize encounters with acid bearing rock through routing and avoidance ▪ Clearing operations will be confined to the working width (RoW and TWR). Existing vegetation will be preserved where possible and a vegetated buffer zone will be maintained as appropriate to protect resources at risk. Merchantable timber will be salvaged. Vegetative debris will be chipped on-site, away from surface waters, for use as mulch or compost feedstock. Burning of vegetative debris will be prohibited as a pollution prevention measure ▪ Watercourse assessments will be conducted if the pipeline or any other facility, such as an access road, will cross a watercourse. This assessment would include a pre-construction survey to evaluate fish habitat and resources in the area of the crossing. The results will be forwarded to NSDEL along with an application for Water Approval ▪ Mitigation procedures for blasting within 500 m of a well. Procedures would include interviewing the well owner prior to construction, and collecting and archiving water samples for comparison of water chemistry ▪ The open end of the pipeline section will be capped at night to prevent any material from infilling the pipe and/or the ingress of small animals ▪ Rare plant locations adjacent to RoW, access locations, and other areas will be flagged. Workers and activities will be restricted to the RoW and designated work areas. The construction period will be minimized ▪ Workers and activities will be restricted to the RoW and designated work areas ▪ The construction period will be minimized ▪ Controlled access/signage ▪ Strict vehicle speed regulation and enforcement
▪ Following installation of the onshore pipeline, the working width (RoW and TWR) will be restored. The working width will be stabilized, seeded and allowed to revegetate. EnCana will use native species in revegetation efforts and avoid use of invasive species. Construction debris will be transported to an approved disposal site
▪ Clearing will be undertaken, where feasible, outside the breeding season for most bird species (i.e., between March and August)
▪ Deer wintering areas will be avoided. Construction activities conducted within 200 m of deer wintering areas will not occur, if feasible, between January and April if snow depths are greater than 30 cm
▪ While not prohibited, use of ATVs on the pipeline RoW will be discouraged through posting of warning signs along the RoW, and consultations with local ATV clubs

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[29] Taken from the previously approved 2002 CSR; Section 9, Table 9.1 Deep Panuke Project Summary of Commitments. Some commitments may have been changed in EnCana's 2006 EA Report.

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

- Vegetation management will be conducted mainly by mechanical means and will be confined to the RoW. Herbicide use will be restricted to fenced valve sites and meter stations and will involve low application rates of compounds with low persistence and low ecological toxicity. Herbicides will not be used within close proximity (e.g., 30 m) of watercourses or wetlands
- There will be no change in the landfall location that would take it outside the study corridor identified in the CSR. There is virtually no potential change in the pipeline route that would cause the onshore portion of the pipeline to be greater than 5 km in length
- Dust suppression techniques will be used if required
- If blasting is required for the Project, EnCana will consult with affected landowners
- EnCana will have the onshore pipeline RoW inspected by an archaeologist, in association with an Aboriginal representative, after the survey line is marked and prior to any ground disturbance activities
- A professional archaeologist and an aboriginal representative will be on site during onshore pipeline construction, and if a site is encountered, work will be halted and the Nova Scotia Museum will be contacted

Subsea Pipeline Routing and Construction

- A survey vessel with ROV will undertake pre-lay and as-laid surveys of the pipeline route
- EnCana will consult with fishers and other impacted stakeholders on the offshore pipeline route
- EnCana will take into consideration the location of existing subsea cables when routing the pipeline. EnCana will notify and consult with all involved parties prior to and during construction of the proposed pipeline
- While laying in close proximity to the SOEP pipeline, a temporary exclusion zone will be set up to eliminate the risk of damage. In addition, if an anchored vessel is used and if the anchor cables cross the SOEP pipeline, a buoy will be placed on the anchor cable to prevent the cable from falling onto or damaging the SOEP pipeline, should the cable break
- EnCana will ensure that DND is made aware of the pipeline routing to ensure that military training activities pose no threats to the integrity of the facility
- The pipeline will be designed to withstand impacts from conventional mobile fishing gear in accordance with the Det Norske Veritas (DNV) Guideline No. 13, Interference between Trawl Gear and Pipelines, September, 1997
- The pipeline design and trenching in the nearshore area will take into account the potential for sea ice
- Known marine archaeological sites will be avoided
- A professional archaeologist and an Aboriginal representative will be on call during subsea pipeline construction; if a previously unidentified wreck or subsea archaeological site is encountered, work will be halted and the Curator of Special Places at the Nova Scotia Museum will be contacted
- No pipeline construction activities will take place in the nearshore area during the lobster fishing season (April 19 – June 20) which also coincides with the period when the endangered roseate tern typically prospects for nests and lays eggs on Country Island (May 1 – June 20). EnCana will also maintain a 2 km buffer zone from Country Island at all times as per the EnCana Code of Practice for Country Island
- Silt curtains will be employed during nearshore dredging
- If blasting is required for pipeline installation, it will be conducted in accordance with all applicable regulations, and with the Guidelines for Use of Explosives In or Near Canadian Fisheries Waters
- Hydrostatic testing of the pipeline will include the following:
    - The pipeline will be hydrostatically tested during commissioning using treated seawater which will be drawn from a location near the landing site in Goldboro. The chemicals to be used will be screened through the Offshore Chemical Selection Guidelines
    - A study, consisting of two components, will be undertaken to assess the impact of the selected hydrostatic testing chemicals discharged into the marine environment. A lab-based toxicity bioassay program (first study component) will be undertaken, which will employ samples of the proposed chemical diluted in seawater to emulate the mixture of chemicals and concentrations proposed for the hydrostatic test program. The results will be applied in a plume dispersion model (second study component) to confirm that there will be minimal impact to the marine environment around the platform. Prior to undertaking this study, the parameters and scope of the bioassay study will be discussed with Environment Canada and DFO
    - Hydrostatic test fluids will not be discharged into the nearshore environment

Vessel and Helicopter Traffic

- Standard vessel operations procedures, including avoidance measures, will be adhered to
- Vessel activities associated with the Deep Panuke Project will adhere to all applicable shipping regulations, including those with respect to the discharge of bilge/ballast water
- Guidelines for Project aircraft and vessels operating in the vicinity of Sable Island and Country Island will be incorporated

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

into the Project EPP as per respective EnCana Codes of Practice

- Helicopters will avoid colonies and high concentrations of birds
- To avoid potential adverse effects caused by vessel traffic, a buffer zone (approximately 2 km) surrounding Sable Island will be established for the Project. The Project will comply with the Sable Island Emergency Contingency Plan (Canadian Coast Guard 1985) and flying over the island will be avoided except in emergency or other non-routine situations (e.g., emergency refueling) as per EnCana's Code of Practice for Sable Island
- If a landing on Sable Island is required (i.e., at the existing helicopter refueling facility), helicopters will avoid flying over or landing in close proximity to large concentrations of horses and seals, and pilots will take advice from the Island manager on the position of breeding tern colonies. In addition, landing approaches will be made at right angles to the long axis of the Island and be as steep as safely possible to minimize the area of the island exposed to low-level flying
- If non-routine Project related vessel or helicopter traffic must interact with Sable Island, any observed adverse animal reactions, or other adverse effects associated with the traffic, will be recorded and reported to appropriate regulatory agencies

Safety Zone

- A safety zone for the Project will be established 500 m around all platforms (and drilling rig when it is on location), in accordance with the Nova Scotia Offshore Area Petroleum Production and Conservation Regulations. Fishing activity will be prohibited within this zone. The need and extent of the Project's safety zone will be determined in consultation with regulators and the fishing industry
- A copy of the offshore site plan will be sent to the Canadian Hydrographic Service to update charts. Notices to Mariners will be issued

Decommissioning

- Requirements for eventual removal of facilities will be taken into consideration in Project design (e.g., the potential presence of contaminants)
- Prior to the start of the decommissioning and abandonment phase, a risk assessment and other required studies will be conducted to verify and validate the assumptions made during the design phase
- Decommissioning and abandonment will be performed in accordance with the regulatory requirements applicable at the time, and in consultation with appropriate regulatory agencies
- The decommissioning plan developed for the Project will provide detailed procedures for decommissioning onshore facilities. The plan will include a full review of options for decommissioning and will be developed in consultation with regulators and key stakeholders, including fisheries interests. The plan will specify the following:
  - Pipelines will be surveyed, and any parts posing an environmental hazard will be recovered
  - Wells will be abandoned in compliance with applicable drilling regulations and according to standard industry practices. The subsea pipeline will be abandoned in place after it is flushed internally and filled with seawater, with its ends capped
  - Water in the jacket legs will be tested to determine disposal alternatives
  - Onshore facilities will be removed and the land restored in accordance with applicable regulations. Buried onshore pipelines will be flushed, capped and abandoned in place. Onshore pipeline RoWs will be allowed to return to their natural vegetative state by natural succession. Any above ground structures associated with onshore pipelines will be remove

Engineering Design

- EnCana will adhere to the Nova Scotia Offshore Petroleum Regulations and the associated CSA codes to the extent applicable. Appropriate exemptions may be sought after review with the Certifying Authority (CA) for the CNSOPB
- Project activities will be conducted in accordance with all applicable laws and regulations
- All Project equipment will meet industry standards and be certified as safe and fit for its intended use. Equipment will be operated and maintained in accordance with documented procedures, with regular inspection and maintenance programs
- Once final engineering design has been completed, appropriate regulatory agencies will be contacted to identify specific permitting requirements, if any
- EnCana will reduce H_2S to "as low as reasonably practicable" (ALARP) before discharging produced water (current design is 1-2 ppm)
- Equipment, valves, and potential areas where hydrocarbon or chemicals could leak will be assessed to determine the need for secondary containment
- It is intended to collect the currently available seismic data for the Deep Panuke site. The fourth generation data will be expedited for the site, and seismic hazard assessment will be performed as per CSA S471. A probability level of 0.0004 per year will be used. Adjustment will be made to convert the data from rock to actual Deep Panuke soil for the pile foundation. A scour allowance of 5 m will be used in the analysis of the platform structures. If spectral hazard parameters are available for the Deep Panuke site, then a probabilistic analysis based on spectral data will be used to determine

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

structural response to the earthquake
▪ A study to evaluate fugitive emissions will be conducted during detailed design. Equipment and procedures to reduce these releases to ALARP will be incorporated in the design
▪ Engineering assumptions and options that are agreed upon and incorporated into final design and construction will be translated into operations and maintenance manuals for personnel use at the operations phase
▪ Once installed, equipment will be operated and maintained in accordance with documented processes and procedures. ▪ EnCana will submit inspection and monitoring programs, a maintenance program and a weight control program to the CA for approval
▪ Necessary critical spares will be maintained should equipment change-out be required
▪ Stacks and flares will be designed to ensure that any air emissions of concern to worker health and safety will be discharged safely with exposures minimized to acceptable levels
▪ The flare will be designed to reduce the potential for liquid carry-over
▪ The flare stack will be designed to optimize plume dispersion (especially its height)
▪ EnCana will design and shield electrical devices that may generate electric and magnetic field (EMF) to minimize worker exposure, and measure EMF levels around electrical devices to ensure compliance with health and safety standards
▪ EnCana will design and construct devices that may generate radiofrequency and microwave radiation to meet relevant safety guidelines and standards, and monitor these devices during commissioning to ensure worker health and safety is protected
▪ Water intake will be designed and built at sufficient depth to reduce the entrainment of marine organisms (e.g., 10-15 m below surface)
Chemical Selection and Use
▪ EnCana will develop a Chemical Management Plan to ensure that Project operations comply with the Offshore Chemical ▪ Selection Guidelines
▪ EnCana intends to use water-based muds (WBM) where it is technically practical
▪ All constituents of WBM and OBM systems will be reviewed and approved for use under the CNSOPB's Offshore ▪ Chemical Selection Guidelines process, and will adhere to EnCana's Chemical Management Plan
▪ The Deep Panuke facility will not use marine antifouling coatings on the structures
▪ Change-out of the amine solvent will be subject to the EPP
Safety Protection Systems and Preventative Maintenance (e.g., design features and procedures)
▪ A detailed Safety Case analysis will be undertaken by EnCana to ensure that appropriate engineering design and materials procurement procedures are incorporated to ensure a safe facility. A comprehensive training program and state-of-the-art detection systems will alert the facility in the case of an accident. Environmental and safety protection systems will be in place (e.g., leak detection, emergency shutdown valves, blowout prevention safeguards, etc.)
▪ A Project Safety Plan will be developed and implemented that will ensure efficient and safe activities in all Project phases. The Safety Plan includes environmental risk assessments that will affect the design of the Project and develop the best design option to minimize environmental impact. The Project Safety Plan will be built upon a "Hazards and Effects Management Process" (HEMP)
Emergency Response/Contingency Planning
▪ EnCana will develop and implement an Emergency Response Contingency Plan (AERCP) for all potential malfunctions and accidents. This plan will specifically address the minimization of blowout potential. Procedures will be developed to respond to a blowout that will include warning and alarm systems. These procedures will be based on the conservative assumptions (i.e., most protective) from the air quality analysis
▪ The Sable Island Emergency Contingency Plan will be adhered to
▪ EnCana's AERCP provides emergency response command and control functions for both onshore and offshore emergency situations, and is currently being used in its East Coast operations activities. The AERCP will be updated for the Deep Panuke Project in compliance with applicable guidelines. This includes response to onshore pipeline releases including those potentially accompanied by fire and subsequent forest fire
▪ EnCana will review and update its Hydrogen Sulphide Contingency Plan and Spill Response Plan for construction and operations of the Deep Panuke Project
▪ The operational EPP will contain chemical handling and storage procedures to ensure all fuel, chemicals and wastes will be handled in a manner that minimizes or eliminates routine spillage and accidents

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

- EnCana's Spill Response Plan will be submitted to the appropriate regulators for review and approval. It will contain detailed measures for preparing for and responding to spills, including the use of clean-up equipment, training of personnel, and identification of personnel to direct cleanup efforts, lines of communication and organizations that could assist cleanup operations. All spills will be reported routinely to regulatory authorities as per Spill Response Plan Notifications
- Spills of petroleum products (or other chemicals) will be cleaned up immediately and reported in accordance with regulations. Oil absorbent pads and "oil dry" compounds will be available at all times in spill kits located at strategic sites on the platforms, to remove petroleum products from deck surfaces. The used absorbent materials and any other oily wastes will be placed in sealed containers and returned to shore for treatment and disposal at an approved waste management facility
- It will be the responsibility of all EnCana employees and contractors to report any accidents, incidents or spills to the Offshore Installation Manager for immediate action in accordance with the EPP
- The standby vessel in the field will also be tasked as part of their regular duties to observe and report any spills from the facilities
- The control room would be staffed 24 hours a day, seven days a week monitoring the facilities
- An open-drain system supplemented by spill trays will ensure that small spills/leaks are contained
- Sheens caused by discharges will be recorded by operations personnel on the platform as a component of ECM. An industry-accepted sheen index will be used to estimate the quantity of oil observed on the water surface

Environmental Protection Planning and Environmental Performance

- EnCana's Environmental, Health and Safety Management System and its associated plans will be followed for the Deep Panuke Project
- EnCana will, in consultation with regulators and key stakeholders, develop onshore and offshore construction EPPs to address Project construction, drilling, production and decommissioning. The EPP will reflect the commitments made in the CSR and regulatory conditions of approval. The EPP will be strictly adhered to
- EnCana will provide copies of applicable management system documentation (and revisions) to the appropriate regulatory authorities for review
- Environmental performance will be reviewed at least annually during the life of the Project
- EnCana has adopted Codes of Practice for Sable Island, Country Island, and the Gully
- A WHMIS program will be in place, and all employees will be WHMIS-trained
- Protection of historic/cultural resources such as shipwrecks will be addressed in the Offshore Construction EPP
- EnCana will continue to support internally and externally funded research and development initiatives relevant to EnCana's operations, financially, technically and with in-kind contributions
- EnCana is a participant in the Voluntary Challenge and Registry (VCR) and will incorporate this Project into the overall VCR strategy. EnCana will consider all reasonable opportunities to reduce emissions from the Deep Panuke Project. Project emissions during the construction phase will be quantified in the annual VCR report
- Environmental Awareness Training for employees and contractor personnel is a component of EnCana's Environmental Management System

Emissions and Waste Management

- The treatment and disposal of wastes will be in accordance with the Offshore Waste Treatment Guidelines (OWTG) and EnCana's environmental protection policies
- A Waste Management Plan (WMP) will be developed (as part of the EPP) to address all phases of the Project. The goal of the plan will be to minimize offshore waste and identify mitigative measures. The WMP will contain provisions for waste and wastewater treatment
- To the extent reasonably practical, both the volumes of wastes being discharged and the concentration of contaminants in the environment will be minimized
- All runoff collected from the open drains system will be treated to meet applicable regulations prior to discharge. All liquids collected in the closed drain system will be pumped back through the facility for separation and removal of hydrocarbons
- During the operation phase, deck drainage will be collected and treated according to the OWTG. Drainage from equipment areas on platforms will be directed through a header system to a collection tank to an oil/water separator treatment unit on the production platform. Petroleum hydrocarbons and sludge in the oil/water separator will be transferred into containers for shipment to shore for disposal. The water from the oil/water separator will be treated using cartridge-style water polishers and tested prior to discharge to ensure compliance with the applicable discharge criteria
- Every reasonable effort will be made to prevent chemical contamination on decks, which could be entrained into deck drainage. Storage areas for totes containing chemicals and petroleum products will have secondary containment to prevent

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

	discharge onto deck surfaces. Absorbents will be used to remove residual hydrocarbons from decks. Spill containment equipment will be available to address emergency spills
▪	Bilge/ballast water will be treated as necessary to meet applicable guidelines prior to discharge
▪	Fluids (e.g., well treatment fluids, well completion and workover fluids) will be treated to meet applicable guidelines prior to ocean discharge
▪	WBM and WBM-associated cuttings will be disposed of overboard, as permitted by the OWTG. Bulk releases on WBMwill be minimized by batch drilling where possible
▪	Non-aqueous drilling fluids (i.e., synthetic-oil-based mud (SBM) and/or enhanced mineral oil-based mud (EMOBM)) and associated cuttings will not be discharged overboard for this Project. If the use of these muds is required, the whole mudwill be returned to the shore for reconditioning or disposal, while the cuttings will be disposed of by either injection into adisposal zone, or onshore treatment and disposal through skip-and-ship methods at an approved facility
▪	Produced water will be treated, tested and discharged overboard according to the OWTG. The OWTG specify an oil in water concentration limit of 30 mg/L (30 day average). EnCana will strive to meet a target dispersed oil in water concentration of 25 mg/L (30 day average) for produced water
▪	Seawater used for indirect cooling will be mixed with produced water before discharge. Total residual chlorine in seawater used in indirect cooling will not normally exceed 0.25 mg/L
▪	Sanitary and food wastes will be macerated to a particle size of 6 mm or less and disposed of overboard
▪	Solid waste will be sorted and disposed of onshore in accordance with applicable regulations and standards. Waste materials will be recycled where possible
▪	Hazardous wastes for onshore disposal will be accumulated in suitable containers and placed in appropriate shipping containers for return to shore for disposal and collected by licensed waste haulers. Applicable regulations and standards will be followed when handling and transporting hazardous waste, and staff will be appropriately trained to do so. A NSDEL-approved hazardous waste contractor will be selected for the disposal of hazardous wastes, and will be regularly audited by EnCana personnel for compliance with regulations
▪	Formation water (produced water) will be collected during drilling of the production wells, and these samples submitted for chemical analysis. The produced water treatment and disposal system will be reviewed following this analysis to ensure the system addresses the specific constituents found in the formation water
▪	Surveys of gamma radiation will be conducted for the presence of naturally occurring radioactive material (NORM), as required
▪	Maintenance of the injection equipment will normally be carried out during scheduled shut-down. Various options such as flaring and platform shut-down will be considered in discussion with the regulators for dealing with acid gas
▪	Wastes accumulated at the onshore pigging station will be collected by tanker truck and removed to an approved waste disposal facility. Prior to shipping, these wastes will be tested to determine the concentrations of organic and inorganic compounds. The testing will identify whether the wastes qualify as hazardous substances and identify the appropriate documentation for transport and means of disposal
Atmospheric Emissions	
▪	Atmospheric discharges will be tested periodically to verify the efficiency of the systems
▪	A camera system will provide continuous visual monitoring of the flare
▪	EnCana is committed to an immediate response to an unplanned change to flaring mode. It is proposed that within seven days of the mode shift, a written response would be submitted to the CNSOPB outlining the options, actions and schedule for resumption of normal operating mode. These procedures will be outlined in the Project flaring procedures to be included in the EPP
▪	EnCana will work with the appropriate regulatory authorities to develop the required reporting mechanism and parameters regarding Project air emissions
▪	EnCana will continually strive to reduce flaring to optimize process efficiency and to improve environmental performance

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

- EnCana will develop flaring mitigation procedures in the EPP to reduce, where practical, the temporary and localized emissions and potential effects associated with flaring events during construction and start-up. Procedures will specify:
    - procedures during perforating/well testing to minimize smoky plumes;
    - safe zones for vessels to occupy during the test flares;
    - go/no go zones for vessels;
    - safety gear and procedures on board platforms and vessels;
    - wind direction forecast requirements such as the need to be sure of sustained wind directions during the test;
    - visibility and other weather requirements;
    - real-time requirements to monitor the efficiency of the flare and downwind effects;
    - reporting requirements to document the safe conduct of the work and potential improvements; and
    - notification procedures for shipping, staff, and environmental staff
- Test flaring will be conducted according to the flare mitigation procedures included in the EPPs. Well test flaring will be scheduled with respect to weather conditions and the presence of marine craft and service vessels to the extent practical. Notifications to Mariners will be issued

Monitoring and Follow-up Studies

- Prior to the Project proceeding, EnCana will develop an Environmental Monitoring Plan
- EnCana will develop a scientifically-sound Environmental Effects Monitoring (EEM) program to detect and assess Project-induced changes in the environment, providing essential feedback to operational managers to provide an early warning mechanism, so that necessary changes can be made to operational activities or discharges. EEM goals will be defined and the program designed through the regulatory approvals process, and consultation with the CNSOPB, regulators and stakeholders. The results of the EEM program will be reviewed on an annual basis and adaptations to the program will be made as necessary
- EnCana is committed to making EEM results publicly available and supports the archiving of environmental monitoring data in a regional database
- EnCana supports the creation of a regional EEM mechanism, which includes regulators, industry and other stakeholders
- The subsea pipeline will be monitored as part of the certification and inspection process. Part of this information will be made available to the EEM as appropriate
- Consultations with DFO and Environment Canada regarding HADD and Disposal at Sea permits, respectively, will occur once engineering design and installation methods have been finalized
- Environmental compliance monitoring (ECM) will primarily involve monitoring for conformance with discharge limits. ECM procedures will be clearly defined in the EPP
- A Physical Environmental Monitoring Program will be developed and implemented with reference to applicable regulations and guidelines. The Plan will include four main programs:
    - Weather and seastate data collection program;
    - Current measurement program;
    - Surface ocean wave measurement program; and
    - Weather forecasting
- EnCana will monitor biofouling of the platform jackets during scheduled underwater ROV inspection surveys. Marine growth will be removed by hydrojetting if the equivalent marine growth thickness approaches the design threshold. Sodium hypochlorite will be used to control biofouling of seawater intakes and discharge caissons. The residual free chlorine concentration at the outlet under normal operating conditions will be below 0.25 ppm
- Prior to construction of the onshore pipeline, a seabed survey will be performed along the pipeline route and at the platform site to provide further data to mitigate effects on marine communities near Project facilities
- EnCana will support oiled bird surveys on Sable Island by an independent biologist
- In the case of an accidental hydrocarbon spill from the Project, it is highly unlikely that there would be any adverse effects on Sable Island. However, if such an interaction were to occur, then monitoring and follow-up will be undertaken to confirm clean-up and recovery
- A survey of the mine workings in the landfall area will be conducted to determine if suitable hibernation habitat for little brown bats is present and EnCana will mitigate as detailed in this CSR
- Prior to construction, a herpetile survey will be conducted to determine if four-toed salamanders are present in the areas identified as having high potential for breeding habitat and EnCana will mitigate as detailed in this CSR.
  Note: A herpetile survey was conducted in June 2002; no four-toed salamanders were found to be present

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

- Prior to June construction, a breeding bird survey will be conducted along the selected pipeline RoW during late May to June to determine whether any rare or sensitive bird species are present and EnCana will mitigate as detailed in this CSR. Note: Breeding Bird Survey was completed in 2002; no rare species identified
- EnCana will provide an awareness program with respect to archaeological sites for construction-related personnel
- EnCana will conduct archaeological monitoring of construction activities at sites that have potential for archaeological finds

Interactions with Fisheries

- Fishers will be notified well in advance of pipelay operations through Notices to Mariners, and by direct contact with key fisheries representatives. Local fishing vessels that meet the requirements of the CNSOPB and Transport Canada will be used to carry out ECM (e.g., turbidity measurements) during dredging or as chase boats during pipelay operations (if required)
- EnCana will require a fisheries exclusion zone in the immediate vicinity of the platform (500 m) over the life of the Project, and temporarily at specific locations along the pipeline route as the installation progresses
- EnCana is committed to developing a compensation program in consultation with fishing interests prior to construction activities. This program will be consistent with the "Compensation Guidelines Respecting Damages Relating to Offshore Petroleum Activity" (March 2002) prepared by the C-NOPB and CNSOPB. The program will be designed to assess the extent of impact to potential claimants and the extent of the claim. The document will also contain an outline of the procedures for making and assessing claims and an appeals process for disputed claims
- In the event that EnCana's activities damage the environment or cause others to suffer loss or damage, EnCana will address its liability through compliance with legislated compensation schemes
- In the event of an interaction between the Project and a fishery it would be managed through a combination of measures, which could include Notice to Mariners, the use of fisheries observers, and consultation with local fishers
- Both the proposed pipeline routing and the construction techniques will be discussed with fishers as part of the consultation process
- Independent and trained observers representing fishing interests will conduct marine bird and mammal observations on Deep Panuke facilities and vessels beyond that required by law, as determined necessary by EnCana

Socio-economic Commitments

- EnCana will continue to provide information on its planned activities, the opportunities associated with them, and the procurement process to the business community, including the First Nations and Aboriginal business community, on a regular basis
- EnCana will continue to work with the Nova Scotia Community College system to ensure that the necessary training programs are in place to meet their anticipated needs for trained labour, and that those who attain employment offshore are fully trained
- EnCana will communicate with the identified communities and/or Chambers of Commerce to ensure that information on possible contracts or business opportunities are made available to those parties who could provide the required services, early in the bidding process
- EnCana will encourage its contractors and subcontractors during construction in the Goldboro area to work with local agencies to seek labour from the District of Guysborough
- EnCana will notify the Municipality of the District of Guysborough, other pertinent agencies (e.g., the School Board responsible for the bussing local children) and the Energy Industry Liaison Committee whenever construction will disrupt traffic flow on Route 316 so that appropriate traffic management techniques can be applied
- EnCana will report as requested to the Energy Industry Liaison Committee established by the Municipality of the District of Guysborough

Stakeholder and Aboriginal Consultation

- EnCana's public communications and consultation program will continue through all phases of the Project

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

- Ongoing consultation activities will include the following components:
  - ongoing liaison with nearshore fishers through open forum meetings, coordinated through local fishers and the Guysborough County Inshore Fisherman's Association;
  - creation of a locally-based nearshore fisheries liaison committee at a time closer to construction;
  - meetings with offshore fisheries representatives as needed;
  - continued liaison with ENGOs as appropriate;
  - continued meetings with First Nations groups;
  - ongoing discussions with local municipalities and regional development authorities;
  - continued participation on NS Petroleum Fisheries Liaison Group (NSPFLG);
  - participation on the Energy Industry Liaison Committee as requested by the Municipality of the District of Guysborough;
  - distribution of newsletters updating the Project status to Guysborough County residents, other stakeholders and other interested members of the public;
  - provision of information provided through the Project website;
  - provision of background information sheets on specific aspects of the Project;
  - maintenance of a toll-free number where people can register concerns or ask for information; and
  - continued opportunities for further comment during the regulatory process

- EnCana will:
  - ensure that public input is communicated to members of the Project team, the objective being to ensure that public comments are addressed in the process of making key decisions about the Project. EnCana is committed to communication and discussion around public and stakeholder concerns and the development of mutually beneficial relationships
  - continue to support the Sable Island Preservation Trust
  - meet with stakeholders to discuss pipeline routing when more detailed information is available
  - meet with stakeholders to consult on construction techniques
  - work toward developing an agreement on principles of cooperation with fisheries interests
  - maintain ongoing consultation with the municipality regarding pipeline routing in the Industrial Park
  - continue to seek advice from stakeholders regarding most effective and efficient means of ongoing consultation and communication
  - collaborate with other operators through CAPP on future cumulative effects initiatives
  - participate with DFO through CAPP in an integrated ocean management and planning program
  - fund offshore training initiative through NSCC
  - make information available on labour requirements and training needs as it becomes availabl

- EnCana will contact all vessels approaching the 500 m safety zone

- EnCana is committed to work collaboratively with other project developers when they are ready to proceed with their projects

- Ongoing consultation activities will include discussions with stakeholders affected by blasting

- EnCana will consult with DND regarding the location of known UXO areas

Legend: Yellow (Bio-Physical); Green (Socio-Economic); and Blue (Other)

APPENDIX 2: EFFECTS EVALUATION CRITERIA DEFINITIONS

Criteria	Definition
Frequency	**Low**: occurrence is unlikely or at sporadic intervals during one phase of the Project lifecycle **Medium**: continuous during one phase of the Project lifecycle **High**: continuous throughout all phases of the Project lifecycle
Duration	**Short term**: only during one phase of the Project **Medium term**: starts in construction and persists through operation **Long term**: beyond the lifecycle of the Project
Reversibility	**Reversible**: adverse environmental effect would return to baseline conditions within the life of the Project **Irreversible**: adverse environmental effect that would continue throughout the lifecycle of the Project or that would be permanent
Geographic Extent	**Immediate**: right-of-way **Local/Area**: 2 km wide corridor centered on the right-of-way **Regional**: East Coast of NS
Magnitude	**Low**: within the normal variability of baseline conditions **Medium**: adverse environmental effect would have a local influence on other physical, biophysical, or social elements **High**: adverse environmental effect would have a regional influence on other physical, biophysical, or social elements